

Term Information

Effective Term Autumn 2022
Previous Value Autumn 2020

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Syllabus updated and GE status change to match the new GE for Foundations Natural Sciences. Goals and Topic list has been updated as course content was slightly adjusted to accommodate the newly created lab that works in partnership with this course. All campuses added.

What is the rationale for the proposed change(s)?

This is to meet the new GE Foundations Natural Sciences requirements

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the request contingent upon the approval of other course or curricular program request? Yes

Please identify the pending request and explain its relationship to the proposed changes(s) for this course (e.g. cross listed courses, new or revised program)

HCS 2200 will be a Foundations Natural Sciences course with the approval of HCS 2203 Introduction to Plant Science Laboratory. Combined these courses will meet the 4 credit hour requirement for a Foundations GE.

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Horticulture and Crop Science
Fiscal Unit/Academic Org	Horticulture & Crop Science - D1127
College/Academic Group	Food, Agric & Environ Science
Level/Career	Undergraduate
Course Number/Catalog	2200
Course Title	The World of Plants
Transcript Abbreviation	World of Plants
Course Description	Study of the cultivation, environmental, genetic, and social/cultural factors which influence the sustainable production of plants for food, fiber, ornamental and recreational uses.
Semester Credit Hours/Units	Fixed: 3

Offering Information

Length Of Course	14 Week, 12 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	Yes
Is any section of the course offered	100% at a distance Greater or equal to 50% at a distance Less than 50% at a distance
Grading Basis	Letter Grade
Repeatable	No

Course Components	Lecture, Recitation
Grade Roster Component	Lecture
Credit Available by Exam	Yes
Exam Type	EM Tests via Office of Testing
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster
Previous Value	Columbus, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites	
Exclusions	
Electronically Enforced	No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	01.1103
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors
General Education course:
Biological Science; Natural Sciences
The course is an elective (for this or other units) or is a service course for other units

[Previous Value](#)

[Required for this unit's degrees, majors, and/or minors](#)
[General Education course:](#)
[Biological Science](#)
[The course is an elective \(for this or other units\) or is a service course for other units](#)

Course Details

Course goals or learning objectives/outcomes	<ul style="list-style-type: none">• Analyze and describe the fundamental concepts of successfully growing plants.• Evaluate how environmental, economic, social, and other factors interact and influence why and how plants are grown.• Describe how the interactions of the components of stable natural ecosystems can be used to create successful, sustainable ecosystems of crops, landscapes, golf courses, and athletic fields.• Evaluate the role plants play in our lives and describe many of the specific plants that fill those roles.• Be able to apply what is learned in this class to other classes and toward success in their careers or for greater enjoyment of an avocation
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Previous Value

- *Analyze and describe the fundamental concepts of successfully growing plants.*
- *Evaluate how environmental, economic, social, and other factors interact and influence why and how plants are grown.*
- *Describe how the interactions of the components of stable natural ecosystems can be used to create successful, sustainable ecosystems of crops, landscapes, golf courses, and athletic fields.*
- *Evaluate the role plants play in our lives and describe many of the specific plants that fill those roles.*
- *Be able to apply what is learned in this class to other classes and toward success in their careers or for greater enjoyment of an avocation.*

Content Topic List

- Introduction to The World of Plants
- The Scientific Method and Natural Science Literacy
- Plant Origins, Classification and Use
- Plants: The Good, the Bad and the Ugly
- Plant: Climate Relations - Solar radiation & moisture
- Plant: Climate Relations - Temperature & air
- Plant & Soils Interaction
- Plant Structure, Growth & Development
- Plant Reproduction, Propagation and Genetics
- Mineral Nutrition & Water
- Integrated Pest Management (IPM)

Previous Value

- *Introduction to "The World of Plants" & group formation*
- *Where do plants grow? Plant Biomes of the World*
- *Growing plants & turf for human use*
- *Plants: The Good, the Bad and the Ugly*
- *Plant: Climate interactions - Solar radiation & moisture*
- *Plant: Climate interactions - Temperature & air*
- *Ohio Veggies!*
- *Plant structure, growth & development*
- *Plant origins, diversity & preservation*
- *Plant reproduction, breeding & propagation*
- *Plant genetics*
- *Soils*
- *Plant mineral nutrition*
- *Native plants & their use*
- *Plant cropping systems: (organic, conventional, sustainable, resilient)*
- *Integrated pest management (IPM)*

Sought Concurrence

No

Attachments

- 2200 and 2203 GE Revisions Response.docx: Response to revisions questions
(Other Supporting Documentation. Owner: Luikart, Meredith Marie)
- HCS 2200 In-Person 1-26-22.docx: Revised In-Person Syllabus
(Syllabus. Owner: Luikart, Meredith Marie)
- HCS 2200_Online_1-26-22.docx: Revised Online Syllabus
(Syllabus. Owner: Luikart, Meredith Marie)
- Response to revisions Round 2 - HCS 2200_2203 - 1-26-22.docx: Revisions response round 2
(Other Supporting Documentation. Owner: Luikart, Meredith Marie)
- sherrattGE-1-26-22.docx: Revised GE Proposal
(GEC Course Assessment Plan. Owner: Luikart, Meredith Marie)

Comments

- Please see Panel feedback sent 12/22/21 RLS *(by Steele, Rachel Lea on 12/22/2021 01:04 PM)*
- Please see Panel feedback email sent 09/21/2021. *(by Hilty, Michael on 09/21/2021 02:56 PM)*
- Please check off all campuses (as requested by OAA for all new GE courses) or provide rationale why a campus should be left out. *(by Vankeerbergen, Bernadette Chantal on 08/20/2021 03:02 PM)*
- This is an existing Natural Sciences GE Course. There is no change to the course other than adjusting the GE Learning Goals and Outcomes to those of the new Natural Sciences GE, and minor changes to the topic list to align with the new GE ELOs. This course is grandfathered into the new GE; and combined with HCS 2203 that is submitted as a new course request, will be a 3 + 1 credit hour Natural Sciences GE. Both courses must be taken to satisfy the Natural Sciences GE requirement.

Revise as per COAA via email 22 July 2021

Revise as per email 15 July 2021 *(by Osborne, Jeanne Marie on 07/27/2021 02:56 PM)*

COURSE CHANGE REQUEST
2200 - Status: PENDING

Last Updated: Osborne, Jeanne Marie
02/02/2022

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Luikart, Meredith Marie	07/09/2021 04:49 PM	Submitted for Approval
Approved	Gardner, David Sean	07/09/2021 10:27 PM	Unit Approval
Revision Requested	Osborne, Jeanne Marie	07/15/2021 03:12 PM	College Approval
Submitted	Luikart, Meredith Marie	07/21/2021 09:56 AM	Submitted for Approval
Approved	Gardner, David Sean	07/21/2021 09:57 AM	Unit Approval
Revision Requested	Osborne, Jeanne Marie	07/22/2021 03:42 PM	College Approval
Submitted	Luikart, Meredith Marie	07/22/2021 10:39 PM	Submitted for Approval
Approved	Gardner, David Sean	07/23/2021 07:59 AM	Unit Approval
Approved	Osborne, Jeanne Marie	07/27/2021 02:59 PM	College Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	08/20/2021 03:03 PM	ASCCAO Approval
Submitted	Luikart, Meredith Marie	08/23/2021 10:57 AM	Submitted for Approval
Approved	Barker, David John	08/23/2021 11:13 AM	Unit Approval
Approved	Osborne, Jeanne Marie	08/24/2021 02:13 PM	College Approval
Revision Requested	Hilty, Michael	09/21/2021 02:56 PM	ASCCAO Approval
Submitted	Luikart, Meredith Marie	11/30/2021 02:51 PM	Submitted for Approval
Approved	Gardner, David Sean	11/30/2021 02:59 PM	Unit Approval
Approved	Osborne, Jeanne Marie	11/30/2021 04:18 PM	College Approval
Revision Requested	Steele, Rachel Lea	12/22/2021 01:04 PM	ASCCAO Approval
Submitted	Luikart, Meredith Marie	02/02/2022 02:15 PM	Submitted for Approval
Approved	Barker, David John	02/02/2022 02:16 PM	Unit Approval
Approved	Osborne, Jeanne Marie	02/02/2022 03:22 PM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	02/02/2022 03:22 PM	ASCCAO Approval

- HCS 2200 approved with one contingency and 6 recommendations:
 - **Contingency – The Panel asks that the GE Proposal document be updated to include the changes that were made to the course syllabus in response to the Panel’s prior feedback. The proposal should function as a stand-alone document that accurately reflects the content of the course. The needed updates include:**
 - **Changing the GE Proposal to reflect the movement of the poster assignments from HCS 2203 to 2200. (GE Proposal pg. 8 under “ELO 1.3”)**

Department response:

The poster assignment was removed completely. Neither course will have this assignment. The proposal has been updated with current lab assignment examples.

- **A revision of the response to how ELO 1.3 will be met (GE Proposal pg. 6-8). This response should include specific examples of the new laboratory experiments and activities that the department outlined in their response to the Panel’s prior feedback**

The proposal has been updated with current lab assignment examples. This includes lab examples that were submitted as part of the feedback from revision round 1.

- *Recommendation: The department’s response to the Panel’s feedback includes the statement that the Digital Plant Collection (formerly Plants of My Life/Plants on Campus) and Aloe Vera assignments have been moved to 2203 from 2200. However, references to these assignments are still present in the in-person syllabus for 2200 (syllabus pgs. 6, 7, 17) even though they have been removed from the online version of the syllabus. The Panel recommends that the in-person syllabus be changed to match the online syllabus and the department’s response to Panel feedback.*

The instructor feels like the Digital Plant Collection is a good fit for the lecture course, HCS 2200. This assignment was removed from the lab syllabus (2203) and added to the lecture. So, this is different from the previous version. The online and in-person assignments have now been updated to match.

- *Recommendation: The online syllabus contains the required statement about how this particular course will meet the Goals and ELOs of the Foundations: Natural Science GE category. However, this statement is missing from the in-person syllabus; in its place is a statement about how the course meets departmental learning objectives. The Panel recommends that the department modify the in-person syllabus to match the online syllabus.*

The statement about how 2200 meets the Goals and ELOs of the Foundations: Natural Science GE has been added to the in-person syllabus and now the online and in-person versions match. The department learning objectives have now been added to online syllabus, to match the in-person syllabus.

- *Recommendation: The Panel recommends that the department modify the Course Change Request (Pg. 3 under “Course goals or learning objectives/outcomes). The goals and ELOs listed here should not be the GE Goals and ELOs, but rather the goals and ELOs of the course.*

The course change request has been updated to remove the GE goals and ELOs.

- *Recommendation: The Panel recommends that the department align points for the “Diversity in Plant Science” assignment. Currently, the Grading and Faculty Response table (online syllabus, pg. 6) says that the assignment is worth 5 points, while the description of the assignment (online syllabus pg. 8) says that it is worth 10 points.*

The points on the assignment table now match the points listed in the descriptions.

- *Recommendation: The Panel recommends that the department consider the mechanics of assuring a variety of responses in the “Diversity in Plant Science” assignment. They encourage the department to consider whether the goal of the assignment is to expose student to a wide variety/large number of plant scientists, or to expose students to plant scientists from traditionally underrepresented populations.*

The instructor has accepted the recommendation of using this “from traditionally underrepresented populations” as part of the assignment description. This is exactly the purpose of this assignment.

- *Recommendation: The Panel recommends that the department reconsider the use of the abbreviation “vs.” in describing the different types of citations that could be used for the Plant Genetics Article Critique (syllabus pg. 9), as they feel this could be confusing to students, and recommend the use of something like “Example 1 and Example 2” as an alternative.*

The instructor has accepted the use of Example 1 and Example 2 for the citation examples and has incorporated that into the syllabus for HCS 2200.

- HCS 2203 approved with two contingencies and one comment:
 - **Contingency – The Panel asks that the GE Proposal document be updated to include the changes that were made to the course syllabus in response to the Panel’s prior feedback. The proposal should function as a stand-alone document that accurately reflects the content of the course. The needed updates include:**
 - **Changing the GE Proposal to reflect the movement of the poster assignments from HCS 2203 to 2200. (GE Proposal pg. 8 under “ELO 1.3”)**

Department Response:

The poster assignment has been removed completely from both courses.

- **A revision of the response to how ELO 1.3 will be met (GE Proposal pg. 6-8). This response should include specific examples of the new**

laboratory experiments and activities that the department outlined in their response to the Panel's prior feedback

The proposal has been updated with current lab assignment examples. This includes lab examples that were submitted as part of the feedback from revision round 1.

- **Contingency – The Panel strongly believes that the workload in this course is appropriate for a 1 credit hour class, however, they ask that the department alter the syllabus language (pg. 3 under “How This Course Works – Credit hours and work expectations”) to coincide with the workload requirement for a 1 credit hour laboratory course that does NOT have 2 consecutive hours of laboratory work. Since this course can be offered in a fully distance format, and 2 *consecutive* hours of lab work per week cannot be guaranteed, the Panel refers the department to Faculty Rule 3335-8-24 (A)(3) and 3335-8-24 (A)(1) found here: <https://trustees.osu.edu/bylaws-and-rules/3335-8>.**

The department has updated the Credit Hours and Work Expectations section on the HCS 2203 syllabus. This should accurately reflect the work expectations for non-consecutive lab hours.

- **Comment – The Panel notes that both the GE proposal form (pg. 2 under “A. Foundations”, pg. 7 under “ELO 1.3” among others) and the syllabus (pg. 3 under “How This Course Works – Mode of Delivery”,) state that all course materials are free to the student. However, some of the labs require materials (for example, strawberries in 3 different stages of decay) that will need to be procured or purchased by the students. The Panel encourages the department to provide students with a list of what they will need for each module well in advance, so that students can make plans to acquire the needed items, as even “common household items” are not always available to students living in dormitories and other student housing.**

The instructor agrees that adding a cost list for lab materials is a good idea. The instructor added a list for the labs that require additional materials. the estimated cost and a link to a possible item. A sentence was also added that states that if a student has financial hardship and cannot afford supplies to contact the instructor as soon as possible to discuss alternative options.

The Panel requests that 2203 be further expanded upon, as they believe that the course is currently too vague to be able to make a determination about the status of the requested 1 credit hour laboratory status. They struggle to see how this course will give students an opportunity to interact directly with the various plants discussed in 2200.

New lab activities were added to HCS 2203 to address the comment about how various plants introduced in 2200 relate to labs in HCS 2203. Explanation of some lab activities are below where we address point 3 from the panel.

The Panel would like to see further justification about how the course meets the ELOs of the new GE Foundation: Natural Sciences. In its current form, it is not clear how the courses meet the Expected Learning Outcomes of the Foundation.

Further explanation on how the HCS 2200 and HCS 2203 meet the GE Foundation: Natural Sciences can be found on (HCS 2203) pages 2-3, and (HCS 2200 online/in-person) pages 1-2.

The Panel requests further clarification surrounding the data collection and analysis aspects of the laboratory portion of the course, as they currently are unsure what the requirements are and what the data collected is and what it will be used for within the laboratory experiments.

Below are examples of lab activities that will be completed in HCS 2203 and how the data collected will be used.

Lab Example 1: Growing Degree Day

The data collected in this lab activity will encompass Growing Degree Day data, which is available free online and through the CFAES website.

<https://weather.cfaes.osu.edu/>

Students will use that data to predict natural occurrences such as weed and insect emergence, harvesting dates, flowering, and disease probability. For the Autumn semester class, students will record the average air temperature every day for one week and calculate the Growing Degree Day. Using data collected over a week, students can select five natural phenomena (i.e. plants/insects/disease) that would be active during the growing degree day, from the Phenology garden website.

<https://weather.cfaes.osu.edu/gdd/>

For the Spring semester class, students will conduct the same activity in mid-April, due to rising temperatures above 50 degrees.

Analysis: Students will use collected data to create a graph for temperature over time which includes a prediction for the following: Spring semester: crabgrass/weeds emergence and Autumn semester: last date they plant grass seed.

Lab Example 2: Soil Textural Analysis

Students will collect three soil samples from three different areas from around where they live. Using these samples, students will conduct two practical experiments. These experiments will consist of 1. Hand textural analysis to determine soil texture and record data for each soil sample, 2. A soil settlement test, which allows students to immerse soil in a solution and see how the different soil components settle over time. Students will then measure each layer and plot that information on the USA Soil Texture Calculator (free online tool from USDA website).

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054167

Analysis: Students will compare their hand textural analysis results with the USDA settlement test, to determine soil texture for each sample. This will help students understand if their first assessment was correct.

Lab Example 3: Strawberry DNA

The strawberry DNA activity will demonstrate how DNA can be isolated from a strawberry using common household materials.

<https://www.genome.gov/Pages/Education/Modules/StrawberryExtractionInstructions.pdf>

Students will compare, 3 underripe, 3 ripe, and 3 overripe strawberries to determine how much white material (DNA) is extracted for each. Results will be recorded and plotted on a graph and posted on Carmen to discuss their results with their peers.

Climate Lab Example – see additional documentation: ClimateLab2022 Example

The Panel questions whether the Poster Assignment, found in the 2203 laboratory course, is reflective of a lab activity and would be better suited in the lecture component of the course and asks the Department to consider this or provide a rationale as to how the Poster Assignment addresses the laboratory component, specifically GE Foundation goal 1.3.

The poster assignment was removed and replaced with the digital plant collection. This new activity consists of a photo collection of twenty plants from eight different plant families. Students will collect these plants throughout the course from areas local to them. They will analyze each sample and classify them by family, genus, and species. The collection will also include a short write up description of each species and submitted online. Submission options are available in the syllabus on page 6.

The Panel has questions surrounding the peer interaction within the laboratory component of the course. For example, on page 5 of the syllabus under the Laboratory Assignments & Quizzes section, the syllabus mentions that the objectives are to “report standardized data to me and to your peer group”, “analyze consolidated peer group data”, and “summarize consolidated peer group data”. They would like further clarification around the peer groups, how they function within the scope of the course, and how they are formed, given the asynchronous nature of the course and students will never physically (and possibly virtually) meet one another.

Students will be assigned a group at random in Carmen. Those assignments will be available the first week of class and posted in Carmen. The peer groups will share data from activities such as Growing Degree Day and the Strawberry DNA experiments. These discussions where students compare their results will help students see the importance of experiment replication and peer review of data, which is important for scientific rigor of experiments and results. Students will select a group leader who will post their collective results to the Carmen Discussion forum.

The Panel would like to see details in the syllabus as to how the group work is managed in the weekly schedule; how a group member working early in the week is guided to collaborate with one working much later in the week.

Deadline for each lab is 11:59 on Sundays. Part of the collaborative process is to make sure they have good communication between group members in order to have all lab activity components collected

and submitted to the elected group leader before the due date. The group leader is responsible for communication with the instructor if a group member is not participating. This information is found on page 3 of the syllabus.

The Panel would like to ask the Department to consider whether the Plants of My Life and Aloe Vera assignment would be better suited for the HCS 2203 laboratory course rather than within the current HCS 2200 course.

Horticulture and Crop Science agree with the suggestion to move the Plants of My Life and Aloe Vera assignments to HCS 2203. The Plants of My Life is now the Digital Plant Collection and the Aloe Vera activity is part of the Integrated Pest Management module, lab 8.

The Panel would like to remind the Department that laboratory exercises each week should be the equivalent of two contact hours, or two hours a week. Please see page 18 of the ASC Curriculum and Assessment Services Operations Manual (under Definition of a Semester Credit Hour) for further information here: https://ascas.osu.edu/sites/default/files/2021-09/2021-22_asc_curriculum_and_assessment_operations_manual.pdf

Credit hours and work expectation are outlined on page three of the syllabus. This 1 credit hour course has two hours of work per week which includes lecture, homework, lab activities, readings, etc.

The Panel recommends that the syllabus clearly state how each component of the course functions within the current and new GE program.

HCS 2200 fulfills the requirement for the current Natural Science GE by providing an introduction to the complex interaction of plants, other organisms (including humans), and their environment. Students gain an understanding of the foundations of modern plant science by studying plant production, plant diversity, ecological relationships within and among species, and the evolutionary forces that shape plant form and function. Additional readings and video content reinforce the plant management concepts introduced in lecture, and also explore scientific reasoning and methods. Students enrolled in HCS 2200 learn details of the interrelationship between technology and scientific methods in modern plant science and gain an appreciation of the social and philosophical ramifications of the knowledge of biology through the study of the history of key discoveries in plant science.

To fulfill the new Foundation: Natural Science GE: HCS 2203 in combination with HCS 2200, is a General Education (GE) Foundations: Natural Sciences course. HCS 2203 fulfills Goal 1 in the GE Foundations: Natural Sciences and Expected Learning Outcome 1.3 and HCS 2200 fulfills Goals 1 (learning outcomes 1.1, 1.2) and Goal 2 (learning outcomes 2.1, 2.2., and 2.3). The 1-credit HCS 2203 laboratory is taken in combination with the 3-credit HCS 2200 lecture and together these 4-credits (i.e., 1-credit laboratory + 3-credit lecture) fulfill ALL Goals (i.e., Goals 1 and 2) and ALL Expected Learning Outcomes (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the GE Foundations: Natural Sciences category.

SYLLABUS

HCS 2200

THE WORLD OF PLANTS

AUTUMN 2022

COURSE OVERVIEW

Instructor

Instructor: Pam Sherratt

Email address: sherratt.1@osu.edu (preferred method of communication)

Phone number: 614-292-7457

Office location: 240C Howlett Hall

Office hours: Wednesdays at noon, or by appointment

Course Organization

Credits: 3

Distribution of class time: Tuesdays and Thursday

Prerequisites (or concurrent): None

Meeting times: Tuesday and Thursdays, 3:55 PM – 5:15 PM

Course description

Study of the cultural, environmental, genetic, and social/cultural factors which influence the sustainable production of plants for food, fiber, ornamental, and recreational uses.

HCS 2200 fulfills 3-credits of the General Education (GE) Category: GE Foundations: Natural Sciences. It is intended to be taken with the 1-credit GE Foundations: Natural Sciences laboratory titled "Introduction to Plant Science Laboratory" (HCS 2203). Together the HCS 2200 lecture (3 credits) and HCS 2203 laboratory (1 credit) fulfill 4-credits of the General Education (GE) Category: GE Foundations: Natural Sciences.

HCS 2200, fulfills 3-credits of the General Education (GE) Category GE Foundations: Natural Sciences. Students will engage in theoretical and empirical study within the natural sciences. Students will gain an appreciation of modern principles, theories, methods and modes of inquiry used generally across the natural sciences. Students will discern the relationship between science and technology, while appreciating the implications of scientific discoveries and the potential impacts of science and technology to address problems of the contemporary world.

HOW HCS 2200 FULFILLS THESE GE NATURAL SCIENCE LEARNING GOALS AND OUTCOMES

This course fulfills the General Education (GE) rationale for the Foundations: Natural Sciences category. HCS 2200 fulfills Specific Goals 1 and 2 Natural Sciences and Expected Learning Outcome 1.1, 1.2, 2.1, 2.2 and 2.3.

When this 3-credit HCS 2200 lecture is taken in combination with the 1-credit HCS 2203 laboratory, together these 4-credits (i.e., 3-credit lecture + 1-credit laboratory) fulfill ALL Goals (i.e., Goals 1 and 2) and ALL Expected Learning Outcomes (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the Foundations, Natural Science GE category.

HCS 2200 GE NATURAL SCIENCES GOALS AND LEARNING OUTCOMES

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, while gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

- Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.
- Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

- Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.
- Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries.
- Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences.

This course fulfills goals 1 and 2, and learning outcomes associated with the goals of the foundations natural science GE through a variety of activities such as the specialty crop and plant diversity assignments, horticulture tour worksheets, GMO article critique and discussion, and Packback questions forum. Students will learn about diverse plant scientists that have made major contributions to the plant science field, and we will discuss the social and ethical implications of technology, trade and regulation of plants. Students will have direct interaction with plants in the lab component (HCS 2203), which will fulfill all of the natural science GE requirements.

Course Goals

1. Analyze and describe the fundamental concepts of successfully growing plants.
2. Evaluate how environmental, economic, social, and other factors interact and influence why and how plants are grown.
3. Describe how the interactions of the components of stable natural ecosystems can be used to create successful, sustainable ecosystems of crops, landscapes, golf courses, and athletic fields.
4. Evaluate the role plants play in our lives and describe many of the specific plants that fill those roles.
5. Be able to apply what is learned in this class to other classes and toward success in their careers or for greater enjoyment of an avocation

How the course learning objectives address departmental learning objectives: HCS 2200 integrates fundamentals of physical and biological sciences in the context of sustainable plant systems (Dept. Objective 2), introduces concepts in translational plant science (Dept. Objective 3), introduces students to the ecological basis of sustainability and sustainable practices (Dept. Objective 4), and instills an appreciation for the necessity of life-long learning and using evaluation and synthesizing skills (Dept. Objective 7).

HOW THIS COURSE WORKS

Mode of delivery: This course is an in-person course and attendance in class is required. There are no required sessions when you must be logged in to Carmen at a scheduled time.

Group work: In week one, you will be assigned a group. Group projects and discussions will be assigned throughout the course and accessed through Carmen. Each group will have a discussion forum within the course.

Pace of activities: This course is divided into **weekly modules** that are released one week ahead of time. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a **3-credit-hour course**. According to [Ohio State policy](#), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Attendance and participation requirements: Your attendance is based on your class activity and interaction, as well as your group participation.

COURSE MATERIALS AND TECHNOLOGIES

TEXTBOOK

OPTIONAL

- Plant Science: Growth, Development, and Utilization of Cultivated Plants 6th Edition (2019), Margaret McMahon

Class Tours

During the class, students will have the opportunity to visit several horticultural facilities on the agriculture campus: Chadwick Arboretum, phenology garden, learning gardens, green roof, Ohio Plant Germplasm Center, and the Howlett greenhouse. Some of these experiences are 'hands-on', some are self-guided, and some are assessed by working with the tour guide and filling in a worksheet.

Other fees or requirements

- Packback fee \$25.00

Course technology

All course materials are distributed via Carmen <http://carmen.osu.edu>, and grades can be viewed there. For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24x7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

BASELINE TECHNICAL SKILLS NECESSARY FOR IN-PERSON COURSE

- Basic computer and web-browsing skills
- Navigating Carmen

REQUIRED EQUIPMENT

- Computer: current Mac (latest Mac OS) or PC (Windows 7 or higher) with high-speed internet connection

REQUIRED SOFTWARE

- [Microsoft Office 365](#): All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found [at go.osu.edu/office365help](http://go.osu.edu/office365help).

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

PACKBACK

Participation is a requirement for this course, and the Packback Questions platform will be used for online discussion about class topics. Packback Questions is an online curiosity community where you can be fearlessly curious and ask BIG questions about how what we're studying relates to life and the real world.

Your participation on Packback will count towards 10 percent of your final grade.

In order to receive your points per week, you must post **1 question and 2 answers relevant to our class subject matter** per week, starting 09/01/20. This will equate to 14 questions and 28 answers over the semester, so the grade will be based on that data.

Before you start posting, be sure to read the [Community Guidelines](#) found in the tutorial on Packback. If your post doesn't follow the Packback Community Guidelines, there is a chance it will be removed, and you won't receive points for that post.

There will be a **Sunday 11:59 PM deadline** for submissions in your community each week.

Each week, we will spend time in Carmen highlighting discussions from Packback, encouraging feedback and recognizing top students!

To start posting on Packback Questions:

1. Navigate to <https://Packback.co/questions> and click “Register as a new student”.
Note: If you already have an account on Packback you can login with your credentials.
2. Make sure to register with your SCHOOL email address and real first name and last name.
3. Enter our class community’s access code into the “Join a new Community” module on your dashboard. Our Community access code: **CAF463AB-D1B5-0DFA-E632-92CDB43F3CFB** <- This code will be updated with current code once semester starts.
4. Follow the instructions on your screen to finish your registration.

For a brief introduction to Packback Questions and why we are using it in class, watch this video: vimeo.com/packback/Welcome-to-Packback-Questions

Packback Accessibility

Information can be found here: <https://www.packback.co/product/accessibility/>

Packback Support

Technical support for Packback can be found here: <https://packback.zendesk.com/hc/en-us/requests/new>

GRADING AND FACULTY RESPONSE

How your grade is calculated

ASSIGNMENT CATEGORY	POINTS
4 Quizzes (10 pts each)	40
My Favorite Specialty Crop assignment	10
Digital Plant Collection	10
5 campus tour worksheets or quizzes: Waterman Farm, Chadwick Arboretum, Green Roof, L. Gardens, OPGC (1 pts each)	5
Diversity in Plant Science assignment	5
GMO Video Critique	5

Packback (class discussion/participation)	20
Self-assessment	5
Total	100

BONUS POINTS (5) ALSO OFFERED

See course schedule below for due dates.

Assignments

4 Quizzes: (40 points) Four quizzes will be offered during the course. The quizzes will be evenly weighted to make up 40 points of the overall grade. There are typically 25 questions per quiz. Quizzes will cover current material outlined in the study guide and will not be comprehensive.

Academic Integrity Policy: Quizzes are completed via Carmen and are timed and open-book. Weekly quizzes are included as self-checks without points attached. You must complete the quizzes yourself, without any external help or communication. If you miss a quiz, you will receive a grade of zero. Make up quizzes will be given only if the student has a legitimate reason for missing the quiz and it is discussed and approved by the instructor prior to the date of the quiz. If an emergency arises and the student misses a quiz, a note from a doctor, clergyman, etc. will need to be provided to schedule a makeup quiz. The instructor reserves the right to verify the authenticity of the document provided by the students for makeup quizzes.

My Favorite Specialty Crop (10 points)

Specialty crops are defined as fruits and vegetables, tree nuts, dried fruits, and horticulture and nursery crops, including floriculture. Specialty crops are **plants that are intensively cultivated**. There are many plants that are specialty crops when cultivated but are also collected from wild populations. For this assignment, I want you to choose a specialty crop and do some research about where the crop originated, what plant family it belongs to, its botanical vs culinary classification, and cover the main features of cultivation (diseases, pests, disorders, pollination, where and how it is most commonly grown). Specialty Crop assignment will be uploaded to Carmen.

Details:

Do some research online to find a specialty crop that interests you. Ideas - Solanaeous crops (potato, tomato, tobacco, etc), Cannabaceae (hemp, hops), Brassicaceae or Cruciferae (broccoli, brussels sprouts, kohlrabi, etc). If you don't know where to start, here is an extensive [list \(Links to an external site.\)](#) to get you going.

Write <500-word summary including:

- Scientific name (genus, species, and authority) e.g. Tomato *Solanum lycopersicum* L. (formerly *Lycopersicon esculentum* Mill.) use a taxonomic database such as [NCBI \(Links to an external site.\)](#)
- Origin (where did the species originate)
- Plant family
- Botanical classification **and culinary classification when appropriate**
- Common diseases, pest, and disorders
- Pollination and seed dispersal
- Ploidy level
- How and where it is commercially grown

Rubric:

- (1) Why you choose the specialty crop for this assignment [2 points]
- (2) Full scientific name including authority [1 point]
- (3) Origin [1 point]
- (4) What plant family it belongs to [1 point]
- (5) Botanical classification and culinary classification where appropriate [1 point]
- (6) Common diseases, pest, and disorders [1 point]
- (7) Pollination and seed dispersal [1 point]
- (8) Ploidy level [1 point]
- (9) Commercial cultivation [1 point]

You could get 2 points extra credit points for exploring how this plant benefits society. This could include, the health-beneficial compounds associated with the crop and medicinal uses or ethnobotanical contributions, and cultural significance.

Academic Integrity Policy: This assignment is open-book, however, you must complete the work on your own without help from peers. Students are encouraged to communicate their findings and conduct peer reviews of each other's work, but no one else should revise or rewrite your work.

Digital Plant Collection (10 points)

Students will take pictures and create a digital collection of 20 species (not varieties) of plants, representing at least 8 different plant families. Plants for the digital plant collection can be found on campus, near your place of residence, or other public access areas (for example, a local park or garden center store i.e. Strader's/Home Depot Garden Center). The digital collection can be presented in a number of ways: power point (or similar) and uploaded to

Carmen, u.osu.edu blog (or similar), Instagram (or similar), image platform such as FLICKR (or similar).

- All plant pictures collected must be 'productive'; i.e. having identifiable value and should contain at least 3 anatomical features used to identify the plant (leaves, stems, flowers, bark, seed, etc.).
- Arrange species alphabetically: first by **family**, second by **genus**, and third **species**.
- Include a table of contents outlining the specimen pictures and their respective page numbers.

Written Description:

- Each species must contain a short write up (2-3 sentences; at least 100 words). This might include: a description of its 'identifiable value'; detail of the history of use of the species; origins; agronomics; economic value; areas where is found/grown, features for identification, etc. Include a citation for your information – since this is not a scientific report, non-refereed sources are permitted.
- Each family (8 in total) must contain a short write up (3-4 sentences; at least 120 words). This might include: a description of common species occurring in the family; identifiable/distinguishing features of the family, other generalities about the importance of the family, etc. Include a citation for your information – since this is not a scientific report, non-refereed sources are permitted.

If obtaining a picture from private property (private gardens, private farm, etc.) permission needs to be obtained and referenced on the label.

Points per Specimen:

Family	2 pt
Genus:	1½ pt
Species:	1½ pt
Common Name:	1 pt
Anatomical Features:	2 pts
Picture quality:	2 pts

(Missing sample, i.e. <20 species)	-10 pts
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Total Grade:*Plant collection*

-20 species x 10 pts = 200 pts

Written description (submitted online)

3 pts per species x 20 = 60 pts

5 pts per family x 8 = 40 pts

Total = 300 points

Sample Label:

Name of the collector:	
Date collected:	
Location:	
Plant family:	
Common name:	
Scientific name:	

Note: Location is optional. Provide name of the city. Indicate where the specimen was collected. Mention the habitat such as agricultural field, park, road side etc.

Additional Information: The **Ohio State University Herbarium (OS)** is a major collection of plant and fungal specimens and is a unit of the **Department of Evolution, Ecology and Organismal Biology**. We are part of OSU's Museum of Biological Diversity. Since its founding in 1891, the collection has grown to approximately half a million specimens and has worldwide coverage, with strengths in flora of the northeastern United States (especially Ohio) and in temperate South America. The Herbarium supports research and teaching at OSU and receives frequent use by researchers from other academic institutions, as well as by staff from governmental agencies such as the Ohio Department of Natural Resources. The collections

continue to grow through contribution of specimens by faculty, students, and associated researchers, as well as by exchange with other herbaria.

Website: <https://herbarium.osu.edu/>

Additional resource for identifying plants: <https://plants.usda.gov/home>

Objectives of the Digital Plant Collection:

1. To be able to identify plant characteristics that are unique to the individual species, but also are representative of its taxonomical family.
2. Further investigate plants and their uses, through independent research.
1. 3. Share the collection with peers in the course community

Academic Integrity Policy: These assignments are open-book, however, you must complete the work on your own without help from peers. Students are encouraged to communicate their findings and conduct peer reviews of each other's work, but no one else should revise or rewrite your work.

5 Campus Tours (5 points)

There will be five tours of green space on campus. Tours: Waterman Farm, Chadwick Arboretum, Green Roof, L. Gardens, OPGC (1 pts each). Students will receive a participation grade for attending the tour AND completing a 1 paragraph reflection on the tour location. The reflection can be the student's thoughts of the location, details from the presentation at the location, and how it relates to plant science.

Academic Integrity Policy: Student reflections should be their own work. No collaboration with other students will be allowed for this assignment. Reflections will be submitted via the Discussion section on Carmen.

Diversity in Plant Science (5) For this assignment, I want you to do some research about people in the plant science industry who have made contributions, discoveries, scientific breakthroughs etc. and tell me about them. The goal is to find plant scientists from traditionally underrepresented populations.

Details:

- Do some research online to find a person in plant science who interests you. Ideas - plant explorer, scientist, grower, teacher, author etc.
- Scroll through your classmates' posts to make sure you do not pick the same person. I do not want duplicate posts. If there is a duplicate post, the student who posted first will get the grade and the 2nd poster will have to re-do.
- Post a picture, video or link to the person you have chosen in Carmen, and tell me a little about them (1-2 paragraphs).

Academic Integrity Policy: Discussion posts must be your own original work. You are encouraged to engage with classmates about the plant scientist you have chosen, but no one else should revise or rewrite your work.

GMO Video Critique: (5 points)

Write a 500 word summary and critique of Learning to Love G.M.O.s by Jennifer Kahn. Please keep your word limit to <500 words.

I would like you to support or refute the main ideas in this article using three different sources. This assignment requires that you examine various sources and identify their relationship to your thesis.

Cite your sources in the text.

In-text citation style examples:

Example 1

Turnbull et al. (2021) have shown the regulatory landscape of genetic modification is still under review.

Example 2

Many scientists agree that gene editing is not “genetic modification” because the method of introducing changes to the DNA is no different from changes that can occur during conventional breeding (Turnbull et al., 2021).

Please add a reference section and follow the format below.

If you are using a reference manager such as Mendeley, Zotero, EndNote... etc., use the [Journal of Experimental Botany \(Links to an external site.\)](#) citation style.

Rubric:

1. Provide a summary of the article [5 points]

2. Include a thesis statement (supporting or refuting the article) [5 points]

A thesis statement identifies the topic being discussed and includes the points discussed in the article. Your thesis statement belongs at the end of your first paragraph. Use it to generate interest in your topic and encourage your audience to continue reading.

3. Use three references to support and refute the article [2 points]

4. Cite references correctly in the text following the *In-text citation* style examples provided above [1 point]

5. Provide a reference page with citations use the formatting style provided above [1 point]

6.) Stay under the **500-word limit** [1 point]

Academic Integrity Policy: This assignment must be your own original work. You are encouraged to ask a trusted person to proof-read your assignment before you turn it in, but no one else should revise or rewrite your work.

Packback Questions Forum (20 points) This forum will be used as our main place to discuss topics and engage with each other. There will be a weekly **Sunday at 11.59pm** deadline for submissions. In order to receive your points per week, you should submit the following per each deadline period:

- 1 open-ended Question per week with a minimum Curiosity Score of 55, each worth 33.33% of each assignment grade
- 2 Responses per week with a minimum Curiosity Score of 55, each worth 66.67% of each assignment grade
- Half credit will be provided for questions and responses that do not meet the minimum curiosity score.

Academic Integrity Policy: Packback discussion posts must be your own original work. You are encouraged to ask a trusted person to proof-read your posts before you turn them in, but no one else should revise or rewrite your work.

Self-Assessment: (5 points)

At the end of the class, students are required to complete a self-assessment. This is a 250-word essay where students are asked to reflect upon their personal effort in the class and how well they worked with the class community.

Academic Integrity Policy: The self-assessment must be your own original work. You should follow [MLA/APA] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proof-read your assignments before you turn them in, but no one else should revise or rewrite your work.

Student participation requirement

Your attendance and participation is essential for the success of this course. The following is a summary of everyone's expected participation:

- In Class Participation: Students are expected to attend in-person course lecture, tour sessions, and guest speaker events. Course material will be uploaded to Carmen for students to review.
- Excused Absences: Students are responsible for reaching out to the instructor in a timely manner, ideally 24 hours before the next class. The instructor understands that there are extenuating circumstances that pop up unexpectedly and will be dealt with on a case by case basis. Students are responsible for reaching out to the instructor either via email, phone, or text. An example of an excused absence: sickness, transportation difficulty, job/internship interview, family emergencies.

Late assignments

All assignments are due by 11:59pm on the designated due date. You can find the actual due dates in the Carmen website under the syllabus/assignment sections. There are no extensions of due dates without documented, extenuating circumstances subject to the approval of the instructor. All requests for extensions must be received by the instructor no less than 1 week prior to the due date; in the case of a documented emergency, you must contact the instructor within 24 hours to request an extension. Make-up quizzes are permitted with permission of instructor. Students must communicate with instructor to establish a day/time for make-up quiz.

GRADING SCALE

Letter Grade	%	Mastery
A	93.00–100.0	Demonstrates complete mastery of all learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
A-	90.00–92.99	
B+	87.00–89.99	Demonstrates mastery of at least two learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
B	83.00–86.99	
B-	80.00–82.99	
C+	77.00–79.99	Demonstrates mastery of at least one learning outcome as demonstrated on assessments; participates in some aspects of the lab in a positive and timely manner. A minimum grade of "C-" will be earned by a student making a good faith effort on all aspects of the lab and demonstrated engagement.
C	73.00–76.99	
C-	70.00–72.99	
D+	67.00–69.99	

D	60.00–66.99	Fails to meet mastery of any learning outcome such that student will not be successful in higher-level course; did not complete assessments; demonstrated lack of engagement, did not participate in lab, did not complete assessment in a timely fashion.
E	00.00–59.99	

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.) In general:

GRADING AND FEEDBACK

For large weekly assignments, you can generally expect feedback within **7 school days**. For exams, you can generally expect feedback within **2 weeks**.

E-MAIL

Email sent to sherratt.1@osu.edu will receive a reply within **24 hours on school days**.

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.
- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

DISCUSSION BOARD

The Carmen discussion section will be used for assignments and not as a primary means for asking questions. Students are encouraged to email questions to sherratt.1@osu.edu or call 614-292-7457.

OTHER COURSE POLICIES

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.
- **For accessibility** – avoid using the colors red and green in presentations and coursework.

ACADEMIC INTEGRITY POLICY

Policies for this course

- **Quizzes:** You must complete the quizzes yourself, without any external help or communication. If you miss a quiz, you will receive a grade of zero. Make up quizzes will be given only if the student has a legitimate reason for missing the quiz and it is discussed and approved by the instructor prior to the date of the quiz. If an emergency arises and the student misses a quiz, a note from a doctor, clergyman, etc. will need to be provided to schedule a makeup quiz. The instructor reserves the right to verify the authenticity of the document provided by the students for makeup quizzes.
- **Written assignments:** Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow **[MLA/APA]** style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

- **Collaboration and informal peer-review:** The course may include opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.
- **Classroom Etiquette:** Interruptions from either unrelated idle conversation during class or from incoming cell phone calls are distracting to learning and inconsiderate to fellow classmates and the instructors. Please keep cell phones **OFF** or in **Etiquette Mode** during class. Exceptions will be granted only for extreme circumstances and with my prior consent.

OHIO STATE'S ACADEMIC INTEGRITY POLICY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's [*Code of Student Conduct*](#), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

UNIVERSITY RESOURCES

Advising

Students are encouraged to speak with their academic or major advising for scheduling issues, degree audit questions or other concerns. Academic advising models vary by department and major. Overview and contact information for advising services offered on main campus can be found at: <https://advising.osu.edu>

Student Services

Overview and contact information for student services (Buckeyelink) on main campus can be found at: <https://contactbuckeyelink.osu.edu> (formerly ssc.osu.edu)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Intellectual Property (covered by copyright) includes Course materials (Text, Audio, Video, Multimedia, Sims, Apps, etc.), and Student Generated materials

Creating an environment free from harassment, discrimination, and sexual misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also

have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,
2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Diversity Statement

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

- <https://odi.osu.edu/>
- <https://odi.osu.edu/racial-justice-resources>
- <https://odi.osu.edu/focus-on-racial-justice>
- <http://mcc.osu.edu/>

In addition, this course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen site for this course; and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident.aspx>.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

Grievance Procedure

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching

assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Disability Accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options.

To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility](#)
- Streaming audio and video
- Synchronous course tools
- [Definition OSU](#)
- [Overview of Accessibility at OSU](#)

- If you require specific software for the course list or provide a link to the software's accessibility privacy statements
 - [Adobe Connect \(Carmen Connect\) Accessibility](#) [Adobe Privacy Policy](#)
 - [MediaSite Accessibility Statement](#)
 - [Microsoft Office Accessibility](#) [Microsoft Office 365 Privacy](#)

COURSE SCHEDULE (TENTATIVE)

*All assignments are due on Sundays at 11:59 PM – check the schedule below for the week they are due. Carmen will provide specific due dates.

Week	Topics	Assessments
1	Introduction to The World of Plants. The Scientific Method and Natural Science Literacy	Bonus 1: Who are you? All Digital Plant Collection Posts Due by Sunday at 11:59 PM
2	Plant Origins, Classification and Use Tour 1 (weather dependent, location TBA)	All Packback Posts Due by Sunday at 11:59 PM Digital Plant Collection Post Tour 1 Reflection Due by Sunday at 11:59 PM
3	Plant Origins, Classification and Use NPR: The Columbus Exchange (Interview) Plants: The Good, the Bad and the Ugly	Packback Digital Plant Collection Post
4	Plant: Climate Relations - Solar radiation & moisture Tour 2 (weather dependent, location TBA)	Quiz 1 – due Sunday at 11:59 PM Digital Plant Collection Post Packback

		Tour 2 Reflection Due by Sunday at 11:59 PM
5	Plant: Climate Relations - Temperature & air	Digital Plant Collection Post Packback
6	Plant & Soils Interaction	Digital Plant Collection Post Packback
7	Plant & Soils Interaction	Diversity in Plant Science Assignment DUE – by Sunday 11:59 PM Digital Plant Collection Post Packback
8	Plant Structure, Growth & Development Tour 3 (weather dependent, location TBA)	Quiz 2 – due Sunday at 11:59 PM Digital Plant Collection Post Packback Tour 3 reflection due by Sunday at 11:59 PM
9	Plant Structure, Growth & Development	Digital Plant Collection Post Packback

10	Plant Reproduction, Propagation and Genetics	<p>My Favorite Specialty Crop Assignment – DUE by Sunday at 11:59 PM</p> <p>Digital Plant Collection Post</p> <p>Packback</p>
11	<p>Plant Reproduction, Propagation and Genetics</p> <p>Tour 4 (weather dependent, location TBA)</p>	<p>GMO Video critique DUE by Sunday at 11:59 PM</p> <p>Digital Plant Collection Post</p> <p>Packback</p> <p>Tour 4 reflection DUE by Sunday at 11:59 PM</p>
12	Mineral Nutrition & Water	<p>Quiz 3 – DUE Sunday at 11:59 PM</p> <p>Digital Plant Collection Post</p> <p>Packback</p>
13	Integrated Pest Management (IPM)	<p>Bonus 2</p> <p>Digital Plant Collection Post</p> <p>Packback</p>
14	<p>Integrated Pest Management (IPM)</p> <p>Tour 5 (weather dependent, location TBA)</p>	<p>Digital Plant Collection Post</p> <p>Packback</p> <p>Tour 5 Reflection DUE by Sunday at 11:59 PM</p>

15	Wrap-up Turn in self-assessment	Digital Plant Collection Post Packback Self-Assessment DUE by Sunday at 11:59 PM
16	Final – Quiz 4 – due Friday at 11:59 PM	

SYLLABUS

HCS 2200 THE WORLD OF PLANTS AUTUMN 2022 ONLINE

COURSE OVERVIEW

Instructor

Instructor: Pam Sherratt

Email address: sherratt.1@osu.edu (preferred method of communication)

Phone/text number: 614-292-7457

Office location: 240C Howlett Hall

Office hours: By appointment through Zoom, Skype, or other videoconferencing tools. Contact instructor to set up a meeting and choose which tool to use.

Course Organization

Credits: 3

Prerequisites (or concurrent): None

Students will be required to participate at least once per week in an activity, such as discussion response, group assignment etc.

Course description

Study of the cultural, environmental, genetic, and social/cultural factors which influence the sustainable production of plants for food, fiber, ornamental, and recreational uses.

HCS 2200 fulfills 3-credits of the General Education (GE) Category GE Foundations: Natural Sciences. It is intended to be taken with the 1-credit GE Foundations: Natural Sciences laboratory titled "Introduction to Plant Science Laboratory" (HCS 2203). Together the HCS 2200 lecture (3 credits) and HCS 2203 laboratory (1 credit) fulfill 4-credits of the General Education (GE) Category: GE Foundations, Natural Sciences.

HOW HCS 2200 FULFILLS THESE GE NATURAL SCIENCES LEARNING GOALS AND OUTCOMES

This course fulfills the General Education (GE) rationale for the GE Foundations: Natural Sciences category. HCS 2200 fulfills Natural Sciences Goals 1 and 2 and Expected Learning Outcome 1.1, 1.2, 2.1, 2.2 and 2.3.

When this 3-credit HCS 2200 lecture is taken in combination with the 1-credit HCS 2203 laboratory, together these 4-credits (i.e., 3-credit lecture + 1-credit laboratory) fulfill ALL Goals (i.e., Goals 1 and 2) and ALL Expected Learning Outcomes (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the Foundations, Natural Science GE category.

HCS 2200 GE FOUNDATIONS: NATURAL SCIENCES GOALS AND LEARNING OUTCOMES

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, while gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

- Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry.
- Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods.

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

- Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments.
- Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries.
- Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences.

This course fulfills goals 1 and 2, and learning outcomes associated with the goals of the foundations natural science GE through a variety of activities such as the specialty crop and plant diversity assignments, horticulture tour worksheets, GMO article critique and discussion, and Packback questions forum. Students will learn about diverse plant scientists that have made major contributions to the plant science field, and we will discuss the social and ethical implications of technology, trade and regulation of plants. Students will have direct interaction with plants in the lab component (HCS 2203), which will fulfill all of the natural science GE requirements.

Course Goals

1. Analyze and describe the fundamental concepts of successfully growing plants.

2. Evaluate how environmental, economic, social, and other factors interact and influence why and how plants are grown.
3. Describe how the interactions of the components of stable natural ecosystems can be used to create successful, sustainable ecosystems of crops, landscapes, golf courses, and athletic fields.
4. Evaluate the role plants play in our lives and describe many of the specific plants that fill those roles.
5. Be able to apply what is learned in this class to other classes and toward success in their careers or for greater enjoyment of an avocation

How the course learning objectives address departmental learning objectives: HCS 2200 integrates fundamentals of physical and biological sciences in the context of sustainable plant systems (Dept. Objective 2), introduces concepts in translational plant science (Dept. Objective 3), introduces students to the ecological basis of sustainability and sustainable practices (Dept. Objective 4), and instills an appreciation for the necessity of life-long learning and using evaluation and synthesizing skills (Dept. Objective 7).

HOW THIS COURSE WORKS

Mode of delivery: This course is 100% online. There are no required sessions when you must be logged in to Carmen at a scheduled time.

Group work: In week one, you will be assigned a group. Group projects and discussions will be assigned throughout the course and can be accessed on Carmen. Each group will have a discussion forum within the course.

Pace of online activities: This course is divided into **weekly modules** that are released one week ahead of time. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within that time frame.

Credit hours and work expectations: This is a **3-credit-hour course**. According to [Ohio State policy](#), students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of (C) average.

Attendance and participation requirements: Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Participating in online activities for attendance: AT LEAST ONCE PER WEEK**
You are expected to log in to the course in Carmen every week. (During most weeks

you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible*.

- **Office hours: OPTIONAL**
Office hours, are optional and by appointment.
- **Participating in discussion forums: 3+ TIMES PER WEEK**
As part of your participation, each week you can expect to post at least three times on Packback as part of our substantive class discussion on the week's topics.

COURSE MATERIALS AND TECHNOLOGIES

TEXTBOOK

OPTIONAL

- Plant Science: Growth, Development, and Utilization of Cultivated Plants 6th Edition (2019), Margaret McMahon

OTHER FEE

- Packback fee \$25.00

Course technology

All course materials are distributed via Carmen <http://carmen.osu.edu>, and grades can be viewed there. For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at <https://ocio.osu.edu/help/hours>, and support for urgent issues is available 24/7.

- **Self-Service and Chat support:** <http://ocio.osu.edu/selfservice>
- **Phone:** 614-688-HELP (4357)
- **Email:** 8help@osu.edu
- **TDD:** 614-688-8743

BASELINE TECHNICAL SKILLS FOR ONLINE COURSES

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).

REQUIRED TECHNOLOGY SKILLS SPECIFIC TO THIS COURSE

- CarmenConnect text, audio, and video chat

- Recording a slide presentation with audio narration
- Recording, editing, and uploading video

REQUIRED EQUIPMENT

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

REQUIRED SOFTWARE

- [Microsoft Office 365](#): All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program. Full instructions for downloading and installation can be found [at go.osu.edu/office365help](http://go.osu.edu/office365help).

You will need to use [BuckeyePass](#) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](#) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click "Enter a Passcode" and then click the "Text me new codes" button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the [Duo Mobile application](#) to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.

PACKBACK

Participation is a requirement for this course, and the Packback Questions platform will be used for online discussion about class topics. Packback Questions is an online curiosity community where you can be fearlessly curious and ask BIG questions about how what we're studying relates to life and the real world.

Your participation on Packback will count towards 10 percent of your final grade.

In order to receive your points per week, you must post **1 question and 2 answers relevant to our class subject matter** per week, starting 09/01/20. This will equate to 14 questions and 28 answers over the semester, so the grade will be based on that data.

Before you start posting, be sure to read the [Community Guidelines](#) found in the tutorial on Packback. If your post doesn't follow the Packback Community Guidelines, there is a chance it will be removed, and you won't receive points for that post.

There will be a **Sunday 11:59 PM deadline** for submissions in your community each week.

Each week, we will spend time in Carmen highlighting discussions from Packback, encouraging feedback and recognizing top students!

To start posting on Packback Questions:

1. Navigate to <https://Packback.co/questions> and click "Register as a new student".
Note: If you already have an account on Packback you can login with your credentials.
2. Make sure to register with your SCHOOL email address and real first name and last name.
3. Enter our class community's access code into the "Join a new Community" module on your dashboard. Our Community access code: **CAF463AB-D1B5-0DFA-E632-92CDB43F3CFB** <- This code will be updated with current code once semester starts.
4. Follow the instructions on your screen to finish your registration.

For a brief introduction to Packback Questions and why we are using it in class, watch this video: vimeo.com/packback/Welcome-to-Packback-Questions

Packback Accessibility

Information can be found here: <https://www.packback.co/product/accessibility/>

Packback Support

Technical support for Packback can be found here: <https://packback.zendesk.com/hc/en-us/requests/new>

GRADING AND FACULTY RESPONSE

How your grade is calculated

ASSIGNMENT CATEGORY	POINTS
4 Quizzes (10 pts each)	40
My Favorite Specialty Crop assignment	10
Digital Plant Collection	10
5 virtual campus tour worksheets or quizzes: Waterman Farm, Chadwick Arboretum, Green Roof, L. Gardens, OPGC (1 pts each)	5
Diversity in Plant Science assignment	5
GMO Video Critique	5
Packback (class discussion/participation)	20
Self-assessment	5
Total	100

BONUS POINTS (5) ALSO OFFERED

See course schedule below for due dates.

Assignments

4 Quizzes: (40 points) Four quizzes will be offered during the course. The quizzes will be evenly weighted to make up 40 points of the overall grade. There are typically 25 questions per quiz. Quizzes will cover current material outlined in the study guide and will not be comprehensive.

Academic Integrity Policy: Quizzes are completed via Carmen and are timed and open-book. Weekly quizzes are included as self-checks without points attached. You must complete the quizzes yourself, without any external help or communication. If you miss a quiz, you will receive a grade of zero. Make up quizzes will be given only if the student has a legitimate reason for missing the quiz and it is discussed and approved by the instructor prior to the date of the quiz. If an emergency arises and the student misses a quiz, a note from a doctor, clergyman, etc. will need to be provided to schedule a makeup quiz. The instructor reserves the right to verify the authenticity of the document provided by the students for makeup quizzes.

My Favorite Specialty Crop (10 points)

Specialty crops are defined as fruits and vegetables, tree nuts, dried fruits, and horticulture and nursery crops, including floriculture. Specialty crops are **plants that are intensively cultivated**. There are many plants that are specialty crops when cultivated but are also collected from wild populations. For this assignment, I want you to choose a specialty crop and do some research about where the crop originated, what plant family it belongs to, its botanical vs culinary classification, and cover the main features of cultivation (diseases, pests, disorders, pollination, where and how it is most commonly grown)

Details:

Do some research online to find a specialty crop that interests you. Ideas - Solanaecous crops (potato, tomato, tobacco, etc), Cannabaceae (hemp, hops), Brassicaceae or Cruciferae (broccoli, brussels sprouts, kohlrabi, etc). If you don't know where to start, here is an extensive [list \(Links to an external site.\)](#) to get you going.

Write <500-word summary including:

- Scientific name (genus, species, and authority) e.g. Tomato *Solanum lycopersicum* L. (formerly *Lycopersicon esculentum* Mill.) use a taxonomic database such as [NCBI \(Links to an external site.\)](#)
- Origin (where did the species originate)
- Plant family
- Botanical classification **and culinary classification when appropriate**
- Common diseases, pest, and disorders
- Pollination and seed dispersal
- Ploidy level
- How and where it is commercially grown

Rubric:

(1) Why you choose the specialty crop for this assignment [2 points]

(2) Full scientific name including authority [1 point]

(3) Origin [1 point]

(4) What plant family it belongs to [1 point]

(5) Botanical classification and culinary classification where appropriate [1 point]

(6) Common diseases, pest, and disorders [1 point]

(7) Pollination and seed dispersal [1 point]

(8) Ploidy level [1 point]

(9) Commercial cultivation [1 point]

You could get 2 points extra credit points for exploring how this plant benefits society. This could include, the health-beneficial compounds associated with the crop and medicinal uses or ethnobotanical contributions, and cultural significance.

Academic Integrity Policy: This assignment is open-book, however, you must complete the work on your own without help from peers. Students are encouraged to communicate their findings and conduct peer reviews of each other's work, but no one else should revise or rewrite your work.

Digital Plant Collection (10 points)

Students will take pictures and create a digital collection of 20 species (not varieties) of plants, representing at least 8 different plant families. Plants for the digital plant collection can be found on campus, near your place of residence, or other public access areas (for example, a local park or garden center store i.e. Strader's/Home Depot Garden Center). The digital collection can be presented in a number of ways: power point (or similar) and uploaded to Carmen, u.osu.edu blog (or similar), Instagram (or similar), image platform such as FLICKR (or similar).

- All plant pictures collected must be 'productive'; i.e. having identifiable value and should contain at least 3 anatomical features used to identify the plant (leaves, stems, flowers, bark, seed, etc.).
- Arrange species alphabetically: first by **family**, second by **genus**, and third **species**.
- Include a table of contents outlining the specimen pictures and their respective page numbers.

Written Description:

- Each species must contain a short write up (2-3 sentences; at least 100 words). This might include: a description of its 'identifiable value'; detail of the history of use of the species; origins; agronomics; economic value; areas where is found/grown, features for identification, etc. Include a citation for your information – since this is not a scientific report, non-refereed sources are permitted.
- Each family (8 in total) must contain a short write up (3-4 sentences; at least 120 words). This might include: a description of common species occurring in the family; identifiable/distinguishing features of the family, other generalities about the importance of the family, etc. Include a citation for your information – since this is not a scientific report, non-refereed sources are permitted.

If obtaining a picture from private property (private gardens, private farm, etc.) permission needs to be obtained and referenced on the label.

Points per Specimen:

Family	2 pt
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Genus:	1½ pt
Species:	1½ pt
Common Name:	1 pt
Anatomical Features:	2 pts
Picture quality:	2 pts
(Missing sample, i.e. <20 species)	-10 pts

Total Grade:*Plant collection*

-20 species x 10 pts = 200 pts

Written description (submitted online)

3 pts per species x 20 = 60 pts

5 pts per family x 8 = 40 pts

Total = 300 points

Sample Label:

Name of the collector:	
Date collected:	
Location:	
Plant family:	
Common name:	
Scientific name:	

Note: Location is optional. Provide name of the city. Indicate where the specimen was collected. Mention the habitat such as agricultural field, park, road side etc.

Additional Information: The **Ohio State University Herbarium (OS)** is a major collection of plant and fungal specimens and is a unit of the **Department of Evolution, Ecology and Organismal Biology**. We are part of OSU's Museum of Biological Diversity. Since its founding in 1891, the collection has grown to approximately half a million specimens and has worldwide coverage, with strengths in flora of the northeastern United States (especially Ohio) and in temperate South America. The Herbarium supports research and teaching at OSU and receives frequent use by researchers from other academic institutions, as well as by staff from governmental agencies such as the Ohio Department of Natural Resources. The collections continue to grow through contribution of specimens by faculty, students, and associated researchers, as well as by exchange with other herbaria.

Website: <https://herbarium.osu.edu/>

Additional resource for identifying plants: <https://plants.usda.gov/home>

Objectives of the Digital Plant Collection:

1. To be able to identify plant characteristics that are unique to the individual species, but also are representative of its taxonomical family.
2. Further investigate plants and their uses, through independent research.
1. 3. Share the collection with peers in the course community

Academic Integrity Policy: These assignments are open-book, however, you must complete the work on your own without help from peers. Students are encouraged to communicate their findings and conduct peer reviews of each other's work, but no one else should revise or rewrite your work.

5 Campus Tours (5 points)

There will be five virtual tours of green space on campus. Tours: Waterman Farm, Chadwick Arboretum, Green Roof, L. Gardens, OPGC (1 pts each). Students will receive a participation grade for attending the tour AND completing a 1 paragraph reflection on the tour location. The reflection can be the student's thoughts of the location, details from the presentation at the location, and how it relates to plant science.

Academic Integrity Policy: Student reflections should be their own work. No collaboration with other students will be allowed for this assignment. Reflections will be submitted via the Discussion section on Carmen.

Diversity in Plant Science (5 points) For this assignment, I want you to do some research about people in the plant science industry who have made contributions, discoveries, scientific breakthroughs etc. and tell me about them. The goal is to find plant scientists from traditionally underrepresented populations.

Details:

- Do some research online to find a person in plant science who interests you. Ideas - plant explorer, scientist, grower, teacher, author etc.
- Scroll through your classmates' posts to make sure you do not pick the same person. I do not want duplicate posts. If there is a duplicate post, the student who posted first will get the grade and the 2nd poster will have to re-do.
- Post a picture, video or link to the person you have chosen in Carmen, and tell me a little about them (1-2 paragraphs).

Academic Integrity Policy: Discussion posts must be your own original work. You are encouraged to engage with classmates about the plant scientist you have chosen, but no one else should revise or rewrite your work.

GMO Video Critique: (5)

Write a 500 word summary and critique of Learning to Love G.M.O.s by Jennifer Kahn.

Please keep your word limit to <500 words.

I would like you to support or refute the main ideas in this article using three different sources. This assignment requires that you examine various sources and identify their relationship to your thesis.

Cite your sources in the text.

In-text citation style examples:

Example 1

Turnbull et al. (2021) have shown the regulatory landscape of genetic modification is still under review.

Example 2

Many scientists agree that gene editing is not “genetic modification” because the method of introducing changes to the DNA is no different from changes that can occur during conventional breeding (Turnbull et al., 2021).

Please add a reference section and follow the format below.

If you are using a reference manager such as Mendeley, Zotero, EndNote... etc., use the [Journal of Experimental Botany \(Links to an external site.\)](#) citation style.

Rubric:

1. Provide a summary of the article [5 points]
2. Include a thesis statement (supporting or refuting the article) [5 points]
A thesis statement identifies the topic being discussed and includes the points discussed in the article. Your thesis statement belongs at the end of your first paragraph. Use it to generate interest in your topic and encourage your audience to continue reading.
3. Use three references to support and refute the article [2 points]
4. Cite references correctly in the text following the *In-text citation* style examples provided above [1 point]
5. Provide a reference page with citations use the formatting style provided above [1 point]
6.) Stay under the **500-word limit** [1 point]

Academic Integrity Policy: This assignment must be your own original work. You are encouraged to ask a trusted person to proof-read your assignment before you turn it in, but no one else should revise or rewrite your work.

Packback Questions Forum (20 points) This forum will be used as our main place to discuss topics and engage with each other. There will be a weekly **Sunday at 11.59pm** deadline for submissions. In order to receive your points per week, you should submit the following per each deadline period:

- 1 open-ended Question per week with a minimum Curiosity Score of 55, each worth 33.33% of each assignment grade
- 2 Responses per week with a minimum Curiosity Score of 55, each worth 66.67% of each assignment grade
- Half credit will be provided for questions and responses that do not meet the minimum curiosity score.

Academic Integrity Policy: Packback discussion posts must be your own original work. You are encouraged to ask a trusted person to proof-read your posts before you turn them in, but no one else should revise or rewrite your work.

Self-Assessment: (5 points)

At the end of the class, students are required to complete a self-assessment. This is a 250-word essay where students are asked to reflect upon their personal effort in the class and how well they worked with the class community.

Academic Integrity Policy: The self-assessment must be your own original work. You should follow [MLA/APA] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proof-read your assignments before you turn them in, but no one else should revise or rewrite your work.

Student participation requirement

Because this is a distance-education course, your attendance is based on your online activity and participation. The following is a summary of everyone's expected participation:

- **Logging in:**
Be sure you are logging in to the course in Carmen at least one time per week, including weeks with holidays or weeks with minimal online course activity. (During most weeks you will probably log in many times.) If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible, and no less than one week prior to the anticipated absence*.
- **Participation in discussion forums:**
You can expect to post an entry to the discussion forum at least one time (sometimes more) per week as part of our class discussion on the week's topics.
- **Lengthy Absences:** The instructor understands that there are extenuating circumstances that pop up unexpectedly and will be dealt with on a case by case basis. Students are responsible for reaching out to the instructor either via email, phone, or text. Examples of a lengthy excused absence: sickness, computer difficulties, family emergencies.

Late assignments

All assignments are due by 11:59pm on the designated due date. You can find the actual due dates in Carmen website under the syllabus/assignment sections. There are no extensions of due dates without documented, extenuating circumstances subject to the approval of the instructor. All requests for extensions must be received by the instructor no less than 1 week prior to the due date; in the case of a documented emergency, you must contact the instructor within 24 hours to request an extension. Make-up quizzes are permitted with permission of instructor. Students must communicate with instructor to establish a day/time for make-up quiz.

GRADING SCALE

Letter Grade	%	Mastery
A	93.00–100.0	Demonstrates complete mastery of all learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
A-	90.00–92.99	
B+	87.00–89.99	Demonstrates mastery of at least two learning outcomes as demonstrated on assessments; participates in all aspects of the lab in a positive and timely manner.
B	83.00–86.99	
B-	80.00–82.99	
C+	77.00–79.99	Demonstrates mastery of at least one learning outcome as demonstrated on assessments; participates in some aspects of the lab in a positive and timely manner. A minimum grade of “C-” will be earned by a student making a good faith effort on all aspects of the lab and demonstrated engagement.
C	73.00–76.99	
C-	70.00–72.99	
D+	67.00–69.99	Fails to meet mastery of any learning outcome such that student will not be successful in higher-level course; did not complete assessments; demonstrated lack of engagement, did not participate in lab, did not complete assessment in a timely fashion.
D	60.00–66.99	
E	00.00–59.99	

Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call **614-688-HELP** at any time if you have a technical problem.)

GRADING AND FEEDBACK

For large weekly assignments, you can generally expect feedback within **7 school days**. For exams, you can generally expect feedback within **2 weeks**.

E-MAIL

Email sent to sherratt.1@osu.edu will receive a reply within **24 hours on school days**.

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail.
- Be concise in the body of the e-mail, use complete sentences and proper grammar.
- Use an appropriate closure at the end of each e-mail followed by your first and last name.

- If replying to an e-mail, reference the original e-mail and its content.
- Be selective of your choice of words. Emotions are difficult to convey in text and without the benefit of facial expressions your sentiment can be lost in the words you choose to write.

DON'T

- Use all capital letters; this conveys a tone of ANGER.
- Use e-mail as a format to criticize other individuals.
- Ask for your grade via e-mail. Grades will not be discussed by e-mail. If you need to discuss a graded item make an appointment to do so in my office.
- E-mail to inquire when grades will be posted. We will work toward submitting grades promptly, however, recognize that grading assignments and exams requires considerable time to ensure uniformity and fairness.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review at a later time when emotions are not directing the content.

DISCUSSION BOARD

The Carmen discussion section will be used for assignments and not as a primary means for asking questions. Students are encouraged to email questions to sherratt.1@osu.edu or call 614-292-7457.

OTHER COURSE POLICIES

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

- **For accessibility** – avoid using the colors red and green in presentations and coursework.

ACADEMIC INTERGITY POLICY

POLICIES FOR THIS ONLINE COURSE

- **Quizzes:** You must complete the quizzes yourself, without any external help or communication. Quizzes are completed via Carmen and are timed and open-book. Weekly quizzes are included as self-checks without points attached.
- **Written assignments:** Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow **[MLA/APA]** style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in—but no one else should revise or rewrite your work.
- **Reusing past work:** In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.
- **Falsifying research or results:** All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.
- **Collaboration and informal peer-review:** The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

OHIO STATE'S ACADEMIC INTEGRITY POLICY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the

University's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages ([COAM Home](#))
- *Ten Suggestions for Preserving Academic Integrity* ([Ten Suggestions](#))
- *Eight Cardinal Rules of Academic Integrity* (www.northwestern.edu/uacc/8cards.htm)

UNIVERSITY RESOURCES

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

David Wirt, wirt.9@osu.edu, is the CFAES embedded mental health counselor. He is available for new consultations and to establish routine care. To schedule with David, please call 614-292-5766. Students should mention their affiliation with CFAES when setting up a phone screening.

Advising

Students are encouraged to speak with their academic or major advising for scheduling issues, degree audit questions or other concerns. Academic advising models vary by department and major. Overview and contact information for advising services offered on main campus can be found at: <https://advising.osu.edu>

Student Services

Overview and contact information for student services (Buckeyelink) on main campus can be found at: <https://contactbuckeyelink.osu.edu> (formerly ssc.osu.edu)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Intellectual Property (covered by copyright) includes Course materials (Text, Audio, Video, Multimedia, Sims, Apps, etc.), and Student Generated materials

Creating an environment free from harassment, discrimination, and sexual misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

1. Online reporting form at equity.osu.edu,

2. Call 614-247-5838 or TTY 614-688-8605,
3. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Diversity Statement

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

- <https://odi.osu.edu/>
- <https://odi.osu.edu/racial-justice-resources>
- <https://odi.osu.edu/focus-on-racial-justice>
- <http://mcc.osu.edu/>

In addition, this course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environmental Sciences. These principles are located on the Carmen

site for this course; and can also be found at <https://go.osu.edu/principlesofcommunity>. For additional information on Diversity, Equity, and Inclusion in CFAES, contact the CFAES Office for Diversity, Equity, and Inclusion (<https://equityandinclusion.cfaes.ohio-state.edu/>). If you have been a victim of or a witness to a bias incident, you can report it online and anonymously (if you choose) at <https://studentlife.osu.edu/bias/report-a-bias-incident.aspx>.

Grievance Procedure

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Disability Accommodations

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options.

To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- [Carmen \(Canvas\) accessibility](#)
 - Streaming audio and video
 - Synchronous course tools
 - [Definition OSU](#)
 - [Overview of Accessibility at OSU](#)
- [Adobe Connect \(Carmen Connect\) Accessibility](#) [Adobe Privacy Policy](#)
 - [MediaSite Accessibility Statement](#)
 - [Microsoft Office Accessibility](#) [Microsoft Office 365 Privacy](#)

COURSE SCHEDULE (TENTATIVE)

*All assignments are due on Sundays at 11:59 PM – check the schedule below for the week they are due. Carmen will provide specific due dates.

Week	Topics	Assessments
1	Introduction to The World of Plants. The Scientific Method and Natural Science Literacy	Bonus 1: Who are you? All Digital Plant Collection Posts Due by Sunday at 11:59 PM
2	Plant Origins, Classification and Use Tour 1 (weather dependent, location TBA)	All Packback Posts Due by Sunday at 11:59 PM Digital Plant Collection Post Tour 1 Reflection Due by Sunday at 11:59 PM
3	Plant Origins, Classification and Use	Packback

	NPR: The Columbus Exchange (Interview) Plants: The Good, the Bad and the Ugly	Digital Plant Collection Post
4	Plant: Climate Relations - Solar radiation & moisture Tour 2 (weather dependent, location TBA)	Quiz 1 – due Sunday at 11:59 PM Digital Plant Collection Post Packback Tour 2 Reflection Due by Sunday at 11:59 PM
5	Plant: Climate Relations - Temperature & air	Digital Plant Collection Post Packback
6	Plant & Soils Interaction	Digital Plant Collection Post Packback
7	Plant & Soils Interaction	Diversity in Plant Science Assignment DUE – by Sunday 11:59 PM Digital Plant Collection Post Packback
8	Plant Structure, Growth & Development Tour 3 (weather dependent, location TBA)	Quiz 2 – due Sunday at 11:59 PM Digital Plant Collection Post Packback

		Tour 3 reflection due by Sunday at 11:59 PM
9	Plant Structure, Growth & Development	Digital Plant Collection Post Packback
10	Plant Reproduction, Propagation and Genetics	My Favorite Specialty Crop Assignment – DUE by Sunday at 11:59 PM Digital Plant Collection Post Packback
11	Plant Reproduction, Propagation and Genetics Tour 4 (weather dependent, location TBA)	GMO Video critique DUE by Sunday at 11:59 PM Digital Plant Collection Post Packback Tour 4 reflection DUE by Sunday at 11:59 PM
12	Mineral Nutrition & Water	Quiz 3 – DUE Sunday at 11:59 PM Digital Plant Collection Post Packback
13	Integrated Pest Management (IPM)	Bonus 2 Digital Plant Collection Post Packback

14	Integrated Pest Management (IPM) Tour 5 (weather dependent, location TBA)	Digital Plant Collection Post Packback Tour 5 Reflection DUE by Sunday at 11:59 PM
15	Wrap-up Turn in self-assessment	Digital Plant Collection Post Packback Self-Assessment DUE by Sunday at 11:59 PM
16	Final – Quiz 4 – due Friday at 11:59 PM	

Application for GE Foundations, Natural Science: 4 credits

1. HCS 2200 - The World of Plants Lecture (3 credits)
2. HCS 2203 - Introduction to Plant Science Laboratory (1 credit)

A. Foundations

Please explain in 50-500 words why or how this course is introductory or foundational in the study of Natural Science.

HCS 2200 and HCS 2203 are taught by the Department of Horticulture and Crop Science (HCS). When taken together (HCS 2200 + HCS 2203) will fulfill 4 credits of the GE Foundations, Natural Science category. The World of Plants Lecture (HCS 2200) is a 3-credit course that is currently taught at Ohio State as a Natural Science, Biological Science GE course. Introduction to Plant Science Lab (HCS 2203) is a brand new 1-credit online laboratory. Both HCS 2200 and HCS 2203 follow a similar sequence in topics that introduce a wide breadth of study within this highly interdisciplinary field.

HCS 2200 will fulfill Natural Science Goals 1 and 2, and Expected Learning Outcomes (ELOs) 1.1, 1.2, 2.1, 2.2, and 2.3. HCS 2203 will fulfill Natural Science Goal 1 and ELO 1.3. When the 1-credit HCS 2203 laboratory is taken in combination with the 3-credit HCS 2202 lecture, together these 4-credits (i.e., 1-credit lab + 3-credit lecture) fulfills all Goals (i.e., Goals 1 and 2) and all ELOs (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 2.3) for the Foundations, Natural Science GE category.

HCS will offer HCS 2200 and HCS 2203 separately as a 3-credit lecture and 1-credit laboratory, rather than combining them together as a 4-credit course. We want to do this because (1) it will allow for greater flexibility for students when scheduling courses, (2) HCS 2203 will be offered exclusively online each semester, while HCS 2200 will be offered as both an in-person synchronous course Spring semester and an online asynchronous course each semester so that students can choose to take HCS 2200 in-person or online.

HCS 2200 and HCS 2203 will foster an understanding of the principles, theories, and methods of modern science, the relationship between science and technology, the implications of scientific discoveries and the potential of science and technology to address problems of the contemporary world. Students will develop a foundational knowledge and understanding of natural sciences to evaluate the economic, social and ethical implications of scientific discoveries and new found technologies. Students will learn that plant science is a multifaceted field of study,

which combines practices, technology, and methods from the biological sciences. Students will develop an understanding for the complex nature of plant ecosystems, how humans are part of and rely on these natural systems, the importance of plants and plant systems, and how different technology and methods can create new uses for plants. Developing scientific literacy skills to encourage life-long learning, will be emphasized throughout the course with high-impact readings, documentaries and the opportunity for students to practice and apply these skills through writing assignments and the creation and presentation of a scientific poster on contemporary topics in environmental science.

HCS 2200 and HCS 2203 will focus on similar topics and follow similar course designs. Course topics will be divided into 8 learning modules (see list below). One module will be taught approximately every two weeks of the semester. Course materials for HCS 2200 and HCS 2203 will be completely free to all students and consist of lecture slides, lecture presentations, lecture transcripts, closed-caption lecture videos, study guides, self-check quizzes, journal articles, book chapters, documentaries, software, technical reports, grading rubrics, and data sets. Course materials will be provided to students through Carmen, the Ohio State Libraries, academic, professional or government websites and online open-source textbooks. Course materials have gone through extensive testing and usage to ensure that they meet accessibility guidelines required by the Ohio State Digital Accessibility Policy. Students who receive accommodations through Student Life Disability Services will receive all required accommodations.

Course Modules for HCS 2200 and HCS 2203:

1. The Scientific Process and Natural Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Proagation and Genetics
7. Mineral Nutrition & Water Requirements
8. Intergrated Pest Management (IPM)

B. Specific Goals for Natural Sciences

GOAL 1: Successful students will engage in theoretical and empirical study within the natural sciences, gaining an appreciation of the modern principles, theories, methods, and modes of inquiry used generally across the natural sciences.

GOAL 1 will be fulfilled in HCS 2200 (Lecture) and HCS 2203 (Laboratory)

Course Modules for HCS 2200 and HCS 2203:

1. The Scientific Process and Natural Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Propagation and Genetics
7. Mineral Nutrition & Water Requirements
8. Integrated Pest Management (IPM)

Expected Learning Outcome 1.1: Successful students are able to explain basic facts, principles, theories and methods of modern natural sciences; describe and analyze the process of scientific inquiry. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 1.1 will be fulfilled in HCS 2200 (Lecture)

HCS 2200 - Quizzes (4 quizzes per semester, 10% each, 40% total): Students will complete a total of 4 quizzes each semester. Each exam will consist of 25 questions that focus on 3 weekly course modules. Quizzes will be completed using Carmen and open for 7 days to accommodate all students. Each exam will be unique and worth 10% of a student's Final Grade for HCS 2200. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Exams will focus on readings, lecture slides and lecture presentations. Exams are open-book, however, students must complete the work on their own without help from peers.

HCS 2200 - Objectives of exams:

1. Evaluate student learning at the end of weekly course modules.
2. Assess reading comprehension, problem solving skills, critical thinking and vocabulary usage.
3. Assess understanding of key concepts principles, theories, and methods.

HCS 2200 - For each exam, students will be required to:

1. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on lecture slides and presentations given by the instructor.
2. Analyze and interpret data presented in figures, graphs and tables.
3. Use reasoning skills to solve problems using mathematics and statistics.
4. Make quantitative comparisons of data presented in graphs and tables.

Expected Learning Outcome 1.2: Successful students are able to identify how key events in the development of science contribute to the ongoing and changing nature of scientific knowledge and methods. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 1.2 will be fulfilled in HCS 2200 (Lecture)

HCS 2200 – Class Discussion (Packback Questions Discussion Forum, 20% total): This forum will be the course discussion platform, to discuss plant science topics relevant to the weekly module and for students to engage with each other. There will be a weekly Sunday at 11.59pm deadline for submissions. In order to receive full credit, students will submit 1 open-ended question per week with a minimum curiosity score of 55 (each worth 33.33% of each assignment grade) and 2 responses per week with a minimum curiosity score of 55 (each worth 66.67% of each assignment grade).

HCS 2200 - Objectives of Packback Questions Discussion Forum:

1. Understand how data is collected by scientists, why replication is important in experiments. Analyze the process of scientific inquiry, principles, theories and methods of natural science.
2. Critically evaluate and responsibly use information from the natural sciences. Analyze data using statistics.
3. Learn how our knowledge and understanding about a scientific discipline has changed over time through the generation of testable explanations and predictions, newfound knowledge, new techniques and new instrumentation.
4. Recognize social and ethical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

HCS 2200 - For each discussion post, students will be required to:

1. Read articles, book chapters and/or technical reports provided by instructor on Carmen or Ohio State Libraries. Watch short documentaries or instructional videos.
2. Ask open-ended, relevant and topical questions each week, and answer questions submitted by their peers. Questions and answers will be based on the articles and book chapters students read, documentaries and instructional videos students watch and data that students collect and analyze.

Expected Learning Outcome 1.3: Successful students are able to employ the processes of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.

Please explain the 1-credit hour equivalent experiential component included in the course: e.g., traditional lab, course-based research experiences, directed observations, or simulations. Please note that students are expected to analyze data and report on outcomes as part of this experiential component. *(50-1000 words)*

ELO 1.3 will be fulfilled in HCS 2203 (Laboratory)

HCS 2203 - Weekly Participation Activities (15 activities per semester, 1% each, 15% total):

Each student will complete a total of 15 weekly participation assignments this semester (1 activity per week), all of which will be submitted on Carmen. Each activity will be open for 7 days to accommodate all students. Each activity will be unique and worth 1% of the student's Final Grade for HCS 2203. These assignments are open-book, however, a student must complete the work on their own without help from peers. A student who demonstrates good faith effort on all aspects of the weekly participation activity and demonstrated engagement in the activity will receive full credit.

HCS 2203 - Objectives of weekly participation activities:

1. To introduce students to each week's lab through readings, instructions or activities.
2. To serve as a formal weekly check-in that promotes and encourages two-way communication between student and instructor.
3. To graph data or organize data in a table. How to calculate mean, standard deviation, range. To compare data between different scientific studies.

HCS 2203 - For each weekly participation activity, students will be required to:

1. Complete a small 15–20-minute task (e.g., graph data, identify unknown samples, construct a scientific table, analyze and/or interpret data) that will be paired with topics contained in weekly modules.

Laboratory Assignments & Quizzes (8, 6.25% each, 50% total): Each student will complete a total of 8 laboratory assignments over 8 labs during the semester, all of which will be submitted on Carmen and due on Sundays at 11:59PM. Each lab will be conducted over one-two weeks and comprise of two related laboratory assignments. For example, Lab Assignment 1 will pertain to the first lab on the Scientific Method (see examples below). Within the first lab assignment, students will collect and report data. Within the second lab assignment students will summarize and analyze class data collected in the first lab assignment. Each assignment will be unique and worth 6.25% of the Final Grade for the course. These assignments are open-book, however, students must complete the work on their own without help from peers. Assignments will be available on Carmen for 7 days to accommodate all students. Readings, data sets, and instructional videos that are required for laboratory assignments will all be free and provided through Carmen.

Objectives of laboratory assignments:

1. Describe common instruments, equipment, techniques and methods used by scientists to collect data. Learn about protocols, operation, benefits and limitations of each.
 - A. Use described methods to collect data and report standardized data to me and to your peer group.
 - B. Analyze consolidated peer group data through calculations (i.e., mean, p-value, standard deviation).
 - C. Summarize consolidated peer group data through visualizations (i.e., graphs, charts, tables).

Each laboratory assignment will consist of two parts:

1. Part 1 - Learn about the lab procedure and how scientists have used the technique or methods in the peer-reviewed literature. Execute the experiment and report standardized data to peer groups on Carmen. Create, analyze and interpret graphs and tables using Microsoft Word and Microsoft Excel.
2. Part 2 - Answer short-answer, multiple choice, matching pairs and T/F quiz questions. These quiz questions will be based on the data that you collect and analyze, and experiments that you conduct on your own at home. Some questions will require you to complete calculations, plot data, analyze tables, and describe procedures and experimental approaches.

Lab Example 1: Growing Degree Day

The data collected in this lab activity will encompass Growing Degree Day data, which is available free online and through the CFAES website.

<https://weather.cfaes.osu.edu/>

Students will use that data to predict natural occurrences such as weed and insect emergence, harvesting dates, flowering, and disease probability. For the Autumn semester class, students will record the average air temperature every day for one week and calculate the Growing Degree Day. Using data collected over a week, students can select five natural phenomena (i.e. plants/insects/disease) that would be active during the growing degree day, from the Phenology garden website.

<https://weather.cfaes.osu.edu/gdd/>

For the Spring semester class, students will conduct the same activity in mid-April, due to rising temperatures above 50 degrees.

Analysis: Students will use collected data to create a graph for temperature over time which includes a prediction for the following: Spring semester: crabgrass/weeds emergence and Autumn semester: last date they plant grass seed.

Lab Example 2: Soil Textural Analysis

Students will collect three soil samples from three different areas from around where they live. Using these samples, students will conduct two practical experiments. These experiments will consist of 1. Hand textural analysis to determine soil texture and record data for each soil sample, 2. A soil settlement test, which allows students to immerse soil in a solution and see how the different soil components settle over time. Students will then measure each layer and plot that information on the USA Soil Texture Calculator (free online tool from USDA website).

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054167

Analysis: Students will compare their hand textural analysis results with the USDA settlement test, to determine soil texture for each sample. This will help students understand if their first assessment was correct.

Lab Example 3: Strawberry DNA

The strawberry DNA activity will demonstrate how DNA can be isolated from a strawberry using common household materials.

<https://www.genome.gov/Pages/Education/Modules/StrawberryExtractionInstructions.pdf>

Students will compare, 3 underripe, 3 ripe, and 3 overripe strawberries to determine how much white material (DNA) is extracted for each. Results will be recorded and plotted on a graph and posted on Carmen to discuss their results with their peers.

Climate Lab Example – see additional documentation: ClimateLab2022 Example

GOAL 2: Successful students will discern the relationship between the theoretical and applied sciences, while appreciating the implications of scientific discoveries and the potential impacts of science and technology.

GOAL 2 will be fulfilled in HCS 2200 (Lecture)

Course Modules for HCS 2200 and HCS 2203:

1. The Scientific Process and Natural Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Propagation and Genetics
7. Mineral Nutrition & Water Requirements
8. Integrated Pest Management (IPM)

Expected Learning Outcome 2.1: Successful students are able to analyze the inter-dependence and potential impacts of scientific and technological developments. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.1 will be fulfilled in HCS 2200 (Lecture)

HCS 2200 - Quizzes (4 quizzes per semester, 10% each, 40% total): Students will complete a total of 4 quizzes each semester. Each exam will consist of 25 questions that focus on 3 weekly course modules. Quizzes will be completed using Carmen and open for 7 days to accommodate all students. Each exam will be unique and worth 10% of a student's Final Grade for HCS 2200. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Exams will focus on readings, lecture slides and lecture presentations. Exams are open-book, however, students must complete the work on their own without help from peers.

HCS 2200 - Objectives of exams:

4. Evaluate student learning at the end of weekly course modules.
5. Assess reading comprehension, problem solving skills, critical thinking and vocabulary usage.
6. Assess understanding of key concepts principles, theories, and methods.

HCS 2200 - For each exam, students will be required to:

5. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on lecture slides and presentations given by the instructor.
6. Analyze and interpret data presented in figures, graphs and tables.
7. Use reasoning skills to solve problems using mathematics and statistics.
8. Make quantitative comparisons of data presented in graphs and tables.

Expected Learning Outcome 2.2: Successful students are able to evaluate social and ethical implications of natural scientific discoveries. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.2 will be fulfilled in HCS 2200 (Lecture)

HCS 2200 – Writing Assignments (4 assignments per semester, 30% total): Students will complete a total of 4 writing assignments each semester, all of which will be submitted on Carmen. Each assignment will be unique and worth from 5% to 15% of a student's Final Grade in HCS 2200. Assignments will be open on Carmen for 14 days to accommodate all students. Readings, data sets, documentaries that are required for writing assignments will all be free and provided through Carmen or links to these materials will be provided on Carmen. These assignments are open-book, however, a student must complete the work on their own without help from peers.

HCS 2200 - Objectives of writing assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine. Understand how journal articles are organized (e.g., abstract, introduction, results) and how to read an article, find information, interpret data and become proficient at reading and understanding figures, graphs and tables.
2. To make informed decisions and develop potential solutions to environmental issues based on published scientific articles, results and data.
3. Develop skills and gain experience in plant identification and scientific writing, and how to effectively present data using pictures, figures and tables.
4. Gain an appreciation for how discoveries in natural science often requires collaboration between many scientists from many different specializations and from many different cultural backgrounds.

HCS 2200 - For each writing assignment, students will be required to:

1. Answer short-answer and essay-style questions. These questions will be based on readings, documentaries or data provided by academic or governmental institutions. Some questions will require students to use formulas and equations, complete calculations, calculate statistical values, plot data, produce tables, and describe procedures and experimental approaches.
2. Use reasoning skills to propose method, protocol or technique that could be utilized to solve an environmental problem.
3. Evaluate the economic, social and ethical implications of scientific discoveries and new technologies.

Expected Learning Outcome 2.3: Successful students are able to critically evaluate and responsibly use information from the natural sciences. Please link this ELO to the course goals and topics and indicate specific activities/assignments through which it will be met. (50-700 words)

ELO 2.3 will be fulfilled in HCS 2200 (Lecture)

HCS 2200 - Quizzes (5 quizzes per semester, 5% each, 25% total): Students will complete a total of 5 quizzes each semester, all of which will be completed using Carmen. Quizzes will be open for 7 days to accommodate all students. Each quiz will contain 10-20 questions that focuses on 1-2 weekly course modules. Students will have two attempts and we will keep the highest score between both attempts. Each attempt will contain new questions and answers. Each quiz will be unique and worth 5% of the Final Grade for HCS 2200. These quizzes are open-book, however, students must complete the work on their own without help from peers. Quizzes will focus on readings and course materials.

HCS 2200 - Objectives of quizzes:

1. Understand how data is collected by scientists, why replication is important in experiments. Analyze the process of scientific inquiry, principles, theories and methods of natural science.
2. Critically evaluate and responsibly use information from the natural sciences. Analyze data using statistics.
3. Learn how our knowledge and understanding about a scientific discipline has changed over time through the generation of testable explanations and predictions, newfound knowledge, new techniques and new instrumentation.
4. Recognize social and ethical implications of scientific discoveries and understand the potential of science and technology to address problems of the contemporary world.

HCS 2200 - For each quiz, students will be required to:

1. Read articles, book chapters and/or technical reports provided by instructor on Carmen or Ohio State Libraries. Watch short documentaries or instructional videos. There will be no cost to the student, all readings and videos will be free.
2. Answer multiple-choice, true/false, matching and fill-in-the-blank questions. These questions will be based on the articles and book chapters that students read, documentaries and instructional videos that students watch and data that students collect and analyze.