Term Information

Effective Term	Autumn 2022

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	2203
Course Title	Introduction to Plant Science Laboratory
Transcript Abbreviation	IntroPlantSciLab
Course Description	Laboratory course designed as an introductory exploration of the world of plant science.
Semester Credit Hours/Units	Fixed: 1

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
Grading Basis	Letter Grade
Repeatable	No
Course Components	Laboratory
Grade Roster Component	Laboratory
Credit Available by Exam	No
Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites	prereq or concurrent with 2200
Exclusions	
Electronically Enforced	Yes

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

Natural Sciences

Course Details

Course goals or learning objectives/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.
- Successful students are able to employ the process of science through exploration, discovery, and collaboration to interact directly with the natural world when feasible, using appropriate tools, models, and analysis of data.

Content Topic List

- The Scientific Method and Natural Science Literacy
- Plant Origins, Classification & Use
- Plant: Climate Relations
- Plant & Soil Interaction
- Plant Structure, Growth & Development
- Plant Reproduction, Propagation & Genetics
- Mineral Nutrition & Water
- Integration Pest Management (IPM)

Sought Concurrence

No

Attachments

- sherrattGE.docx: New GE Application

  (GEC Course Assessment Plan. Owner: Luikart,Meredith Marie)
- Distance Approval Cover Sheet_HCS2203.docx: Distance Learning Cover Sheet

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)
- Tues_HCS 2203 Introduction to Plant Science Laboratory[40].docx: Online Syllabus

  (Syllabus. Owner: Luikart,Meredith Marie)

Comments

- Same comment about all campuses *(by Vankeerbergen,Bernadette Chantal on 08/20/2021 03:03 PM)*
- This course, combined with HCS 2200, an existing Natural Sciences GE course with submitted course change request to the new GE, 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 email 15 July 2021 *(by Osborne,Jeanne Marie on 07/27/2021 02:56 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Luikart,Meredith Marie	07/09/2021 05:08 PM	Submitted for Approval
Approved	Gardner,David Sean	07/09/2021 10:26 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	07/15/2021 03:13 PM	College Approval
Submitted	Luikart,Meredith Marie	07/21/2021 09:57 AM	Submitted for Approval
Approved	Gardner,David Sean	07/21/2021 09:58 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 10:58 AM	Submitted for Approval
Approved	Barker,David John	08/23/2021 11:14 AM	Unit Approval
Approved	Osborne,Jeanne Marie	08/24/2021 02:13 PM	College Approval
Pending Approval	Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadette Chantal Steele,Rachel Lea	08/24/2021 02:13 PM	ASCCAO Approval

SYLLABUS

HCS 2203
INTRODUCTION TO PLANT SCIENCE LABORATORY
AUTUMN 2022 ONLINE

COURSE OVERVIEW

Instructor

Instructor: Pamela Sherratt

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

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: 1

Prerequisites (or concurrent): HCS 2200 The World of Plants

HCS 2203 is an asynchronous virtual laboratory (100% online) that fulfills 1-credit of the General Education (GE) Category: GE Foundations: Natural Sciences. It is intended to be taken with the 3-credit GE Foundations: Natural Sciences course titled "The World of Plants" Lecture (HCS 2200). 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 2203 will utilize multiple online platforms supported by Ohio State. All content, including labs, slides, demonstrations, presentations, notes, videos, readings will be delivered through Carmen (https://carmen.osu.edu) or Ohio State Libraries (https://library.osu.edu/). Students will have free access to all course content for the entire semester.

HCS 2203 is asynchronous and self-paced to give students the ability to access and satisfy requirements within a flexible time frame. Labs are broken down into weekly activities and assignments and students are given 1 week to complete each assignment. All assignments are open book. However, all course requirements must be completed independently by the enrolled student. All assignments, activities, quizzes, and exams must be completed using Carmen.

Course description

Laboratory course designed as an introductory exploration of the world of plant science.

HCS 2203 fulfills 1-credit 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 2203 FULFILLS THESE GE NATURAL SCIENCE GOALS AND LEARNING OUTCOMES

This course, 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.

When this 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.

HCS 2203 GE NATURAL SCIENCES GOAL 1 AND LEARNING OUTCOME

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

HOW THIS COURSE WORKS

Mode of delivery: HCS 2203 is a 100% asynchronous online laboratory taught through Carmen (https://carmen.osu.edu). There are no sessions that require you to be logged into Carmen at a scheduled time. All course materials (i.e., journal articles, newspaper articles, book chapters, database access) will be free with no cost to the student.

Pace of online activities: This laboratory is divided into weekly assignments and activities. Students will complete those assignments and activities each week. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely within each week.

Credit hours and work expectations: This is a 1-credit-hour laboratory. According to Ohio State policy, students should expect to spend 3 hours per week to earn the average grade of "C" in this laboratory. A student's 3-hour-workweek includes direct instruction, taking notes, studying, readings, assignments, quizzes and exams.

Attendance and participation requirements: Because this is an online laboratory, your attendance is based on your online activity and participation. You are expected to log in to Carmen every week. During most weeks you will likely log in multiple times to complete your work. If you have a situation that might cause you to miss an entire week, please email the instructor (sherratt.1@osu.edu) to discuss adjusted timelines.

COURSE MATERIALS AND TECHNOLOGIES

Textbook

REQUIRED

- Lab Manual provided by the instructor through Carmen

OPTIONAL

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

Course technology

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
- Basic skills with Microsoft Word, Excel and PowerPoint
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

REQUIRED EQUIPMENT

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

CARMEN ACCESS

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.

If you experience connection problems with Carmen then the very first thing that you should try is another web browser such as Firefox, Explorer, Chrome, and Safari. If you are having difficulty opening a document or viewing an image or any other issue associated with this class, then it is most likely a problem with your computer, Internet connection or Internet browser. While everything for this class has been thoroughly tested, if you experience a mistake, please let us know so that we can correct it.

GRADING AND FACULTY RESPONSE

How your grade is calculated

ASSIGNMENT CATEGORY	PERCENTAGE
15 - Weekly Participation Activities	30% (2% each)
8 - Laboratory Assignments and Quizzes	50% (6.25% each)
5 – Scientific Poster Assignments	20% (4% each)
Total	**100%**

**See course schedule for due dates. Everything due by 11:59PM on Sundays.*

Weekly Participation Activities (15, 2% each, 30% total): You will complete a total of 15 weekly participation assignments during the semester (1 activity per week), all of which will be submitted on Carmen and due on Sundays at 11:59PM. Each assignment will be unique and worth 2% of your Final Grade for the course. 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.

Objectives of participation activities:

1. Communicate experimental results to lab group and reflect on the experimental process.
2. Further investigate lab concepts through independent research and data analysis.
3. Build community and maintain communication with peers.

For each weekly participation activity, you will be required to complete a small 15–20 minute task (e.g., graph data, construct a scientific table, analyze and interpret data, report results) that will be paired with topics discussed in weekly modules.

Academic Integrity Policy: These participation activities are open-book, however, you must complete the work on your own without help from peers. Student are encouraged to communicate their findings with the peers in their lab group, but no one else should revise or rewrite your work.

Laboratory Assignments & Quizzes (8, 6.25% each, 50% total): You will complete a total of 8 laboratory assignments over 8 labs this semester, all of which will be submitted on Carmen and due on Sundays at 11:59PM. Each lab will be conducted over 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 course schedule below). Within the first lab assignment, you will collect and report data. Within the second lab assignment you will summarize and analyze class data collected in the first lab assignment. Each assignment will be unique and worth 10% of your Final Grade for the course. 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.
2. Use described methods to collect data and report standardized data to me and to your peer group.
3. Analyze consolidated peer group data through calculations (i.e., mean, p-value, standard deviation).
4. Summarize consolidated peer group data through visualizations (i.e., graphs, charts, tables).

Each laboratory assignment will consist of two parts and you will be required to:

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 me and to your peer group on Carmen (see weekly participation activities). Create, analyze and interpret graphs and tables using Microsoft Word and Microsoft Excel.

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.

Academic Integrity Policy: These participation activities are open-book and many of the activities will be carried out in conjuction with a lab peer group. Students are encourage to collaborate with their peers on laboratory assignments (Part 1). Quizzes (Part 2) are timed and open-book. You must complete the quizzes on your own, without help from peers.

Scientific Poster Assignments (5, 4% each, 20% total): You will complete a total of 5 scientific poster assignments this semester, all of which will be submitted on Carmen and due on Sundays at 11:59PM. Each assignment will be unique and worth 4% of your Final Grade for the course. An open textbook titled “Scientific Posters, A Learners Guide” will serve as a free reference as you complete your poster assignments: https://ohiostate.pressbooks.pub/scientificposterguide/ .

Objectives of scientific poster assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine.
2. 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.
3. Become familiar with scientific writing and how to effectively communicate results, information, data, and technical material in a scholarly work (e.g., poster, journal article, technical report).
4. Conduct a peer review and understand its importance to the scientific process.
5. Create scientific figures and tables. Write a caption for each figure and table.

The 5 scientific poster assignments that you will complete this semester (4% each):

1. **Poster Assignment 1:** Find, download, and read 6 primary source journal articles using Ohio State University Libraries' free online resources (https://library.osu.edu/). These articles should all focus on the same topic and/or issue of your choice. Find, read or watch 4 secondary sources on this same topic and/or issue. Write a concise 200–300-word summary of the information found in your sources.
2. **Poster Assignment 2:** Write a title, abstract and introduction section for your poster.
3. **Poster Assignment 3:** Use Microsoft PowerPoint and Excel to create a total of 4 figures and/or tables for your poster. Figures can be charts, diagrams, graphs, illustrations, images, maps, photographs. Using data from journal articles, you must create at least 1 original graph and 1 original table for your poster. Write a caption for each figure and table.
4. **Poster Assignment 4:** Create a scientific poster using PowerPoint from a template that is provided by your instructor. This poster will contain a title, author information, introduction, materials and methods, results, discussion, references, figures, and tables.
5. **Poster Assignment 5:** Record a 5-minute poster presentation and upload the video and a PDF file of your poster to the Virtual Poster Event on Carmen. Conduct peer reviews for 2 of your classmates' poster presentations.

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.

Late policy

Assignments will be submitted on Carmen within a flexible time frame of 1 week. These can be completed at any time within the 1-week submission window. Students will be permitted to work 1-week ahead if they choose to do so. Submission after the due date for assignments will result in a **10% deduction per day from the overall grade. The submission window will automatically close after 10 days from the due date and will not reopen.** Submissions that are sent by email will not be accepted. All assignments must be submitted on Carmen.

Extenuating circumstances sometimes occur. Students who miss an assessment due to a legitimate reason (e.g., emergency, hospital visit, extended illness) should contact their instructor to request permission to make-up an assignment. The instructor will determine if an excuse is acceptable. If approved, the student will not be penalized -10% per day. If approved, the student must make up the missed assessment within a time frame specified by the instructor. Since this course has flexible due dates with assignments open for a period of days to weeks on Carmen, acceptable excuses typically entail lengthy illness, extended hospitalization or other serious issues with official documentation.

The due date for each assignment is provided on Carmen on the very first day of the semester to help students plan their semester. It is the responsibility of the student to know the due date

for all assignments. We do this to accommodate students' busy schedules. Students are expected to plan their semester accordingly. Technical glitches such as a bad internet connection, faulty internet browser, a computer that "crashes", a battery that runs out of power, an obnoxious roommate, software malfunction, a flat tire, etc. are not acceptable excuses for missing a deadline. The instructor does not accept assignments by e-mail, and these will be deleted and not graded. Assignments should always be completed and/or submitted using Carmen.

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	

Instructor 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 614-688-4357 (HELP) at any time if you have a technical problem.

- **Preferred contact method:** The instructor will check and reply to emails daily. Please email sherratt.1@osu.edu as this is the email dedicated to the course. Please use your OSU email account to send emails to this account. We will reply to emails within **24 hours on days when class is in session at the university**.

- **Class announcements:** All important class-wide messages will be sent through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** I will check and reply to messages in the discussion boards once mid-week and once at the end of the week.
- **Grading and feedback:** For assignments, you can expect a grade and feedback within **7-10 days**. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

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. Beware not all students perceive color in the same way. When you use color also use **Bold**, *Italicize* or Underline as emphasis. A good practice is to use the Accessibility Checker in all Microsoft Office 365 products available to all students.
- **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. I will provide specific guidance for discussions on controversial or personal topics.
- **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.

EMAIL ETIQUETTE

Professional relationships should be maintained when using e-mail for a class. Below I have included guidelines from Bloomsbury's guide on email etiquette that you should follow when drafting your e-mail.

DO

- Include a descriptive statement in the subject line.
- Use proper salutations when beginning an e-mail. For example: Dear/Hello Prof Buckeye,
- 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. For example: Sincerely/Thank you, Brutus Buckeye.
- 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 during office hours.
- 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. I will typically post an Announcement when large grades are released.
- Send an e-mail out of frustration or anger. Learn to save the e-mail as a draft and review later when emotions are not directing the content.

Fair assessment practices

We understand that grades are important to our students and we strive to have clearly stated learning outcomes. We work hard to ensure that student grades are calculated in a fair and accurate manner. Things that we do to ensure that the assessments we administer are fair and accurate:

1. We use grading rubrics to score all laboratory and poster assignments. These rubrics provide clear grading expectations for varying levels of mastery. Students are able to see a grading rubric before they start working on an assignment so that performance expectations are clearly understood.
2. We evaluate the outcomes of assignments by checking all questions and all answers after an assignment closes to check for mistakes. Typically, we want to see that each question was answered correctly approximately 80% of the time. This 80% threshold indicates that a question was a fair assessment of the course material. If this threshold is not met, we do not count the question or we provide students with another opportunity to answer a new question.
3. We encourage students to do well on assessments by making all assignments open-book and allowing students to complete all assignments from anywhere.
4. We encourage students to do well on assessments by providing students an extended period of time (e.g., 7 days) to complete assignments.
5. We accept late assignments with a small penalty of -10% deduction per day late. This ensures that a student would not receive an automatic grade of 0% for missing an assignment.
6. We provide clearly stated learning outcomes for our modules that are aligned to course content and assessments so that students better understand why they are completing an activity.

If you have questions about these practices or how your grade is calculated throughout the semester, please contact your instructor at sherratt.1@osu.edu

OTHER COURSE POLICIES

Academic integrity policy

POLICIES FOR THIS ONLINE COURSE

- **Assignments**: Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow the provided course 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. For the poster assignment, we will use Turn-In-In software to check for plagiarism. Students will not receive credit for plagiarized 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 at sherratt.1@osu.edu.

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 the instructor suspects that a student has committed academic misconduct in this lab, the instructor is obligated by University Rules to report 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)

Grievances

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. Contacts for The School of Environment and Natural Resources can be found here: https://senr.osu.edu/our-people

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. Under The Ohio State University's Intellectual Property Policy, faculty retain copyright in their creative and scholarly works. Students also hold the copyright in their own creative and scholarly works. The requirement to provide a copy of a paper or project created as an assignment for class does not mean that the student has surrendered their copyright.

For more information see: https://library.osu.edu/copyright/basics

Academic support services

The Ohio State University offers a variety of free services to aid students in their academic success. Below I have listed several that may be of use in this course. Additional academic support may be available through individual academic departments. Please consult your academic advisor or your program's website for more information.

- **Walter E. Dennis Learning Center** - provides academic workshops and courses designed to help students be more successful in their academics. Learning Specialists are available to meet with students individually to discuss topics like time management, study skills, test anxiety, etc.
- **Younkin Success Center** - houses a variety of services and resources for students including a computer lab and 24-hour study space during finals week. Also offered are tutoring, academic services, career services, and wellness services.
- **Center for the Study and Teaching of Writing** - assists students in writing research papers, lab reports, resumes, etc.
- **University Libraries** - provides over 20 libraries on campus, online resources, nationwide databases, etc.

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. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766**. 24-hour emergency help** is available through the National Suicide Prevention Lifeline website (suicidepreventionlifeline.org) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app (go.osu.edu/wellnessapp) is also a great resource.

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.

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:

- Online reporting form at **equity.osu.edu**,
- Call 614-247-5838 or TTY 614-688-8605,
- 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."

This course adheres to The Principles of Community adopted by the College of Food, Agricultural, and Environment 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.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

The university strives to make all learning experiences as accessible as possible. 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 (SLDS). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

DISABILITY SERVICES CONTACT INFORMATION

- Phone: 614-292-3307
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: Baker Hall 098, 113 W. 12th Avenue

Accessibility of course technology

This course requires use of CarmenCanvas (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 as early as possible.

- CarmenCanvas accessibility (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)
- Microsoft 365 accessibility
- Turnitin accessibility

ACCESSIBILITY PRACTICES IN THIS COURSE

Several accessibility accommodations are already built into our course for all students (see list below). We work to provide these accommodations to all students and want to make sure all students have a positive learning experience in our course. Please send documentation from SLDS to sherratt.1@osu.edu in order to establish any further accommodations needed during the semester.

1. **Extended Time (1.5x or 2x) Assignments: SLDS-REGISTERED STUDENTS SHOULD EMAIL THEIR PLAN**. A student must send their completed SLDS paperwork to the instructor at sherratt.1@osu.edu. Once accommodations are verified, we will setup all assessments accordingly.
2. **Note Taking Assistance/Recording: PROVIDED TO ALL STUDENTS.** We provide all lab presentation slides via Carmen. Fully typed transcripts for lab presentations are provided via YouTube. Students can copy/paste the entire typed transcript anytime using any word processing software (e.g., Microsoft Word) directly from YouTube for all videos. These transcripts serve as written notes for all lectures.
3. **Closed-captioning and transcripts: PROVIDED TO ALL STUDENTS.** All required multimedia (e.g., videos, podcasts) are accompanied with closed captioning or transcripts that meet ADA requirements. Most times these features are provided by the content producer (e.g., The New York Times, PBS, NPR, Nature, National Geographic). However, you may find select transcripts produced by the course team and linked in Carmen.
4. **Flexible due dates for assignments: PROVIDED TO ALL STUDENTS.** All assignments are open on Carmen for a period of at least 7 days to accommodate students' busy schedules. Students can complete these assignments anytime while the window is open. Extenuating circumstances sometimes occur. Students who miss a due date for a legitimate reason (e.g., emergency, hospital visit, extended illness, unforeseen health issue, homelessness) should contact the instructor before the due date by email (sherratt.1@osu.edu) to request additional time. The instructor will determine if an excuse is acceptable.

COURSE SCHEDULE

Refer to the CarmenCanvas course for up-to-date due dates.

Week	Topic	Assessment	Due Date
1	Lab 1: The Scientific Method and Natural Science Literacy	Participation Activity 1 Lab Assignment 1	Sunday at 11:59PM
2	Lab 2: Plant Origins, Class & Use	Participation Activity 2 Lab Assignment 2	Sunday at 11:59PM
3		Participation Activity 3	Sunday at 11:59PM
4	Lab 3: Plant: Climate Relations	Participation Activity 4 Poster Assignment 1	Sunday at 11:59PM
5		Participation Activity 5 Lab Assignment 3	Sunday at 11:59PM
6	Lab 4: Plant & Soil Interaction Information Literacy & Poster Work	Participation Activity 6 Lab Assignment 4	Sunday at 11:59PM
7		Participation Activity 7 Poster Assignment 2	Sunday at 11:59PM
8	Lab 5: Plant Structure, Growth & Dev.	Participation Activity 8 Lab Assignment 5	Sunday at 11:59PM
9		Participation Activity 9	Sunday at 11:59PM
10	Lab 6: Plant Reprod., Prop. & Genetics Information Literacy & Poster Work	Participation Activity 10 Poster Assignment 3	Sunday at 11:59PM
11		Participation Activity 11 Lab Assignment 6	Sunday at 11:59PM
12	Lab 7: Mineral Nutrition & Water	Participation Activity 12 Lab Assignment 7	Sunday at 11:59PM
13	Lab 8: IPM	Participation Activity 13 Lab Assignment 8	Sunday at 11:59PM
14	Poster Presentations	Participation Activity 14 Poster Assignment 4 Poster Assignment 5	Sunday at 11:59PM
15	Wrap Up	Participation Activity 15	Sunday at 11:59PM

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 Natual Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Progagation 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 Natual Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Progagation and Genetics
7. Mineral Nutrition & Water Requirements
8. Intergrated 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.

<u>HCS 2200 - Objectives of exams:</u>

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.

<u>HCS 2200 - For each exam, students will be required to:</u>

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 relevent 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 responsibility 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 course schedule 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.

HCS 2203 - Scientific Poster Assignments (5 assignments per semester, 4% each, 20% total): Students will complete a total of 5 scientific poster assignments this semester, all of which will be submitted on Carmen. Each assignment will be unique and worth 4% of a student's Final Grade for HCS 2203. These assignments are open-book, however, students must complete the work on their own without help from peers. An open textbook titled "Scientific Posters, A Learners Guide" will serve as a reference as students complete poster assignments: https://ohiostate.pressbooks.pub/scientificposterguide/. This textbook is free to all students.

HCS 2203 - Objectives of scientific poster assignments:

1. Locate primary source journal article using Web of Science, PubMed or another search engine.
2. 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.
3. Become familiar with scientific writing and how to effectively communicate results, information, data, and technical material in a scholarly work (e.g., poster, journal article, technical report).
4. Conduct peer review and understand its importance to the scientific process.
5. Create scientific figure and tables. Write a caption for each figure and table.

HCS 2203 - Five scientific poster assignments that students will complete each semester:

1. Poster Assignment 1: Find, download and read 6 primary source journal articles using Ohio State University Libraries' free online resources (https://library.osu.edu/). These articles should all focus on the same topic and/or issue of a student's choice. issue of a student's choice. Find, read or watch 4 secondary sources on this same topic and/or issue. Write a concise 200–300-word summary of the information found in sources.
2. Poster Assignment 2: Write a title, abstract and introduction section for scientific poster.
3. Poster Assignment 3: Use Microsoft PowerPoint and Excel to create a total of 4 figures and/or tables for poster. Figures can be charts, diagrams, graphs, illustrations, images, maps, photographs. Using data from journal articles, students will create at least 1 original graph and 1 original table for their poster.
4. Poster Assignment 4: Create a scientific poster using PowerPoint from a template that is provided by instructor. This poster will contain a title, author information, introduction, materials and methods, results, discussion, references, figures and tables.
5. Poster Assignment 5: Students will record a 5-minute poster presentation and upload the audio file and a PDF file of their poster to the Virtual Poster Event on Carmen. Students will conduct peer reviews for 2 of their classmates' poster presentations.

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 Natual Science Literacy
2. Plant Origins, Classification & Use
3. Plant:Climate Relations
4. Plant & Soil Interaction
5. Plant Structure, Growth & Development
6. Plant Reproduction, Progagation and Genetics
7. Mineral Nutrition & Water Requirements
8. Intergrated 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 culaural 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 responsibility 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.

Distance Approval Cover Sheet

For Permanent DL/DH Approval

Course Number and Title: HCS 2203 Introduction to Plant Science Laboratory

Faculty Preparer Name and Email: Pam Sherratt, sheratt.1@osu.edu

Carmen Use

For more on use of Carmen: https://teaching.resources.osu.edu/teaching-topics/carmen-common-sense-best-practices

A Carmen site will be created for the course, including a syllabus and gradebook at minimum. **YES** Select

If no: Enter additional details if you responded no...

Syllabus

Proposed syllabus uses the ODEE distance learning syllabus template (or own college distance learning syllabus template based on ODEE model), includes boilerplate language where required, as well as a clear description of the technical and academic support services offered, and how learners can obtain them. **YES** Select

Syllabus is consistent and is easy to understand from the student perspective. **YES** Select

Syllabus includes a schedule with dates and/or a description of what constitutes the beginning an end of a week or module. **YES - the course schedule is broken down into weeks**. Select

If there are required synchronous sessions, the syllabus clearly states when they will happen and how to access them. **No synchronous sessions**. Select

Additional comments (optional):
Enter any additional comments about syllabus...

Instructor Presence

For more on instructor presence: https://teaching.resources.osu.edu/teaching-topics/online-instructor-presence

Students should have opportunities for regular and substantive academic interactions with the course instructor. Some ways to achieve this objective:

- ☑ Regular instructor communications with the class via announcements or weekly check-ins
- ☑ Instructional content, such as video, audio, or interactive lessons, that is visibly created or mediated by the instructor

☑ Regular participation in class discussion, such as in Carmen discussions or synchronous sessions

☑ Regular opportunities for students to receive personal instructor feedback on assignments

Please comment on this dimension of the proposed course (or select/explain methods above):

Delivery Well-Suited to DL/DH Environment

Technology questions adapted from the Quality Matters rubric. For information about Ohio State learning technologies: https://teaching.resources.osu.edu/toolsets

The tools used in the course support the learning outcomes and competencies. **YES** Select

Course tools promote learner engagement and active learning. **YES** Select

Technologies required in the course are current and readily obtainable. **YES** Select

Links are provided to privacy policies for all external tools required in the course. **YES** Select

Additional technology comments:
Enter any additional comments about course technology...

Which components of this course are planned for synchronous delivery and which for asynchronous delivery? (For DH, address what is planned for in-person meetings as well.)
This couse is asynchronous with no synchronous or in person meeting times.

If you believe further explanation would be helpful, please comment on how course activities have been adjusted for distance learning:
Enter comments...

Workload Estimation

For more information about calculating online instruction time: ODEE Credit Hour Estimation

Course credit hours align with estimated average weekly time to complete the course successfully. **YES** Select

Course includes direct (equivalent of “in-class”) and indirect (equivalent of “out-of-class)” instruction at a ratio of about 1:2. **YES** Select

Provide a brief outline of a typical course week, categorizing course activities and estimating the approximate time to complete them or participate:

Week 4

Recorded online lecture: 1 hour

Participation activity: twenty minutes to complete activity

Lab 3 assignment: 1 hour

Poster assignment 1: 1 hour

In the case of course delivery change requests, the course demonstrates comparable rigor in meeting course learning outcomes. **YES** Select

Accessibility

For more information or a further conversation, contact the accessibility coordinator for the College of Arts and Sciences. For tools and training on accessibility: Digital Accessibility Services

Instructor(s) teaching the course will have taken Digital Accessibility training (starting in 2022) and will ensure all course materials and activities meet requirements for diverse learners, including alternate means of accessing course materials when appropriate.**YES** Select

Information is provided about the accessibility of all technologies required in the course. All third-party tools (tools without campus-wide license agreements) have their accessibility statements included**. YES** Select

Description of any anticipated accommodation requests and how they have been/will be addressed.

From HCS 2203 syllabus:

Extended Time (1.5x or 2x) Assignments: SLDS-REGISTERED STUDENTS SHOULD EMAIL THEIR PLAN. A student must send their completed SLDS paperwork to the instructor at sherratt.1@osu.edu. Once accommodations are verified, we will setup all assessments accordingly.

Note Taking Assistance/Recording: PROVIDED TO ALL STUDENTS. We provide all lab presentation slides via Carmen. Fully typed transcripts for lab presentations are provided via YouTube. Students can copy/paste the entire typed transcript anytime using any word processing software (e.g., Microsoft Word) directly from YouTube for all videos. These transcripts serve as written notes for all lectures.

Closed-captioning and transcripts: PROVIDED TO ALL STUDENTS. All required multimedia (e.g., videos, podcasts) are accompanied with closed captioning or transcripts that meet ADA requirements. Most times these features are provided by the content producer (e.g., The New York Times, PBS, NPR, Nature, National Geographic). However, you may find select transcripts produced by the course team and linked in Carmen.

Flexible due dates for assignments: PROVIDED TO ALL STUDENTS. All assignments are open on Carmen for a period of at least 7 days to accommodate students' busy schedules. Students can complete these assignments anytime while the window is open. Extenuating circumstances sometimes occur. Students who miss a due date for a legitimate reason (e.g., emergency, hospital visit, extended illness, unforeseen health issue, homelessness) should contact the instructor before the due date by email (sherratt.1@osu.edu) to request additional time. The instructor will determine if an excuse is acceptable.

Additional comments:
Enter any additional comments about accessibility...

Academic Integrity

For more information: https://go.osu.edu/teaching-resources-academic-integrity

The course syllabus includes online-specific policies about academic integrity, including specific parameters for each major assignment: **YES** Select

Assignments are designed to deter cheating and plagiarism and/or course technologies such as online proctoring or plagiarism check or other strategies are in place to deter cheating: **YES** Select

Additional comments:
Enter additional comments about academic integrity...

Frequent, Varied Assignments/Assessments

For more information: https://teaching.resources.osu.edu/teaching-topics/designing-assessments-student

Student success in online courses is maximized when there are frequent, varied learning activities. Possible approaches:

- ☑ Opportunities for students to receive course information through a variety of different sources, including indirect sources, such as textbooks and lectures, and direct sources, such as scholarly resources and field observation
- ☑ Variety of assignment formats to provide students with multiple means of demonstrating learning
- ☑ Opportunities for students to apply course knowledge and skills to authentic, real-world tasks in assignments

Comment briefly on the frequency and variety of assignment types and assessment approaches used in this course (or select methods above):
Enter comments, 1-3 sentences...

Community Building

For more information: https://teaching.resources.osu.edu/teaching-topics/student-interaction-online

Students engage more fully in courses when they have an opportunity to interact with their peers and feel they are part of a community of learners. Possible approaches:

- ☑ Opportunities for students to interact academically with classmates through regular class discussion or group assignments
- ☑ Opportunities for students to interact socially with classmates, such as through video conference sessions or a course Q&A forum
- ☑ Attention is paid to other ways to minimize transactional distance (psychological and communicative gaps between students and their peers, instructor, course content, and institution)

Please comment on this dimension of the proposed course (or select methods above):
Enter comments, 1-3 sentences...

Transparency and Metacognitive Explanations

For more information: https://teaching.resources.osu.edu/teaching-topics/supporting-student-learning-your

Students have successful, meaningful experiences when they understand how the components of a course connect together, when they have guidance on how to study, and when they are encouraged to take ownership of their learning. Possible approaches:

- ☑ Instructor explanations about the learning goals and overall design or organization of the course
- ☑ Context or rationale to explain the purpose and relevance of major tasks and assignments
- ☑ Guidance or resources for ancillary skills necessary to complete assignments, such as conducting library research or using technology tools
- ☑ Opportunities for students to take ownership or leadership in their learning, such as by choosing topics of interest for an assignment or leading a group discussion or meeting
- ☑ Opportunities for students to reflect on their learning process, including their goals, study strategies, and progress
- ☑ Opportunities for students to provide feedback on the course

Please comment on this dimension of the proposed course (or select methods above):
Enter comments, 1-3 sentences...

Additional Considerations

Comment on any other aspects of the online delivery not addressed above:
Enter any additional considerations...