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	2204
Course Title	Ecology of Managed Plant Systems
Transcript Abbreviation	Ecol Manag Plt Sys
Course Description	Origin, diversification, and biogeography of plants inhabiting managed landscapes.
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?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
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	
Exclusions	2201
Electronically Enforced	Yes

Cross-Listings

Cross-Listings

Subject/CIP Code

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

Requirement/Elective Designation

Required for this unit's degrees, majors, and/or minors

Sustainability

Course Details

Course goals or learning objectives/outcomes

- Be able to recognize and describe the characteristics of representative families and genera found in croplands, forests, and urban/suburban landscapes.
- Be familiar with the basic principles and concepts of taxonomy, phylogeny, evolution, genetics and speciation as they relate to crops, ornamental plants, and weeds.
- Understand the biotic and abiotic factors influencing production of food, fiber and fuel from managed ecosystems
- Understand the ecological basis for sustainable practices in managed ecosystems.

Content Topic List

- Introduction to Agroecology
- Classification & Systematics
- Origins & Domestication
- Basic Genetics & Breeding
- GMOs
- Plant variation & Cultivars
- Agricultural Experimentation
- Climate and Weather Systems
- The Plant Environment
- Nutrients & Soil
- Interactions Between Organisms (competition, insects, disease, weeds)
- Structure of Managed Ecosystems
- Plants and People

Sought Concurrence

Yes

Attachments

- GE Submission Checklist HCS2204.docx: GE checklist

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)

- Concurrence_SENR.pdf: Concurrence - SENR

  (Concurrence. Owner: Luikart,Meredith Marie)

- Concurrence from FCOB.pdf: Concurrence - Fischer College of Business

  (Concurrence. Owner: Luikart,Meredith Marie)

- Concurrence - COE 2204_2205.pdf: Concurrence - Engineering

  (Concurrence. Owner: Luikart,Meredith Marie)

- Ohio_State_Course_Review_Concurrence_Form_EEOB_2204 signed.pdf: Concurrence EEOB

  (Concurrence. Owner: Luikart,Meredith Marie)

- submission-sustainability HCS2204 - revised.pdf: GE Submission - sustainability revised

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)

- HCS2204 revised 24May2022.docx: Syllabus - revised

  (Syllabus. Owner: Luikart,Meredith Marie)

- Response to Committee.docx: Response to committee

  (Other Supporting Documentation. Owner: Luikart,Meredith Marie)

Comments

- Please see Panel feedback email sent 03/07/2022. *(by Hilty,Michael on 03/07/2022 12:13 PM)*
- Returned per Department request

  Additional revision needed as per email 7 Feb 2022

  Revise as per COAA via email 24 January 2022

  Revise as per email 17 January 2022 *(by Osborne,Jeanne Marie on 02/08/2022 04:05 PM)*
- make required *(by Barker,David John on 01/13/2022 03:12 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Luikart,Meredith Marie	01/13/2022 03:05 PM	Submitted for Approval
Revision Requested	Barker,David John	01/13/2022 03:12 PM	Unit Approval
Submitted	Luikart,Meredith Marie	01/13/2022 03:16 PM	Submitted for Approval
Approved	Barker,David John	01/13/2022 03:20 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	01/18/2022 10:09 AM	College Approval
Submitted	Luikart,Meredith Marie	01/19/2022 09:00 AM	Submitted for Approval
Approved	Barker,David John	01/19/2022 10:07 AM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	01/24/2022 01:41 PM	College Approval
Submitted	Luikart,Meredith Marie	02/03/2022 10:29 AM	Submitted for Approval
Approved	Barker,David John	02/03/2022 12:46 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	02/07/2022 02:10 PM	College Approval
Submitted	Luikart,Meredith Marie	02/07/2022 02:56 PM	Submitted for Approval
Approved	Barker,David John	02/07/2022 03:10 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	02/08/2022 04:05 PM	College Approval
Submitted	Luikart,Meredith Marie	02/08/2022 04:27 PM	Submitted for Approval
Approved	Barker,David John	02/08/2022 04:27 PM	Unit Approval
Approved	Osborne,Jeanne Marie	02/09/2022 04:25 PM	College Approval
Revision Requested	Hilty,Michael	03/07/2022 12:13 PM	ASCCAO Approval
Submitted	Luikart,Meredith Marie	05/24/2022 04:40 PM	Submitted for Approval
Approved	Gardner,David Sean	05/24/2022 04:47 PM	Unit Approval
Revision Requested	Osborne,Jeanne Marie	05/24/2022 04:57 PM	College Approval
Submitted	Luikart,Meredith Marie	05/24/2022 05:17 PM	Submitted for Approval
Approved	Barker,David John	05/24/2022 05:18 PM	Unit Approval
Approved	Osborne,Jeanne Marie	05/24/2022 05:46 PM	College Approval
Pending Approval	Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadette Chantal Steele,Rachel Lea	05/24/2022 05:46 PM	ASCCAO Approval

THE OHIO STATE UNIVERSITY

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May 24, 2022

Dr Jim Fredal, Faculty Chair of the Themes Panel, and
Dr Maria Conroy, Faculty Chair of the Theme Advisory Group: Sustainability,
College of Arts and Sciences
The Ohio State University

Drs Fredal and Conroy,

The Committee are thanked for their input to HCS2204 Ecology of Managed Plant Systems. This letter responds to the 1 comment, 2 contingencies, and 1 recommendation in your email of March 7, 2022.

"Comment: The reviewing faculty were very supportive of this course and its inclusion within the GE Theme: Sustainability."

We thank the committee for their enthusiasm for this course.

"**Contingency: The reviewing faculty request more detail on how the GE Theme ELOs are being met and, specifically, how the course assignments are being used to meet the GE ELOs**."

Detail of how the GE Theme ELO's will be met and the role of course assignments was provided in Page 3 of the syllabus.. I assume the committee read the syllabus, and I thus provide additional detail as requested.

Excerpt from Page 3 of Syllabus
"This course fulfills the General Education learning objectives for the Sustainability Theme by:

- Engaging in critical and logical thinking about the topic of sustainability through a series of lectures, discussions, and writing (PackBack) with a focus on sustainability and managed plant ecosystems (i.e. the agroecosystem). Weekly reflective writing assignments will require the students to study and understand the agroecosystem, and the genetic, biotic and abiotic factors affecting the plant we use.
- Engaging in an advanced, in-depth, and scholarly exploration through a semester-long study of the variety of agroecosystems used in western and global communities.
- Identifying, describing, and photographing 15 plant species, and describing the impact of each species on the sustainability of the agroecosystem.
- Demonstrating a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts. Throughout the semester, students will submit written observations of sustainable (or not) practices and responses to questions posed by their classmates that relate to topics raised in lectures each week. These interactions will allow students to build on their knowledge throughout the semester.
- Describing elements of the fundamental dependence of humans on Earth and environmental systems, and on the resilience of these systems through lectures and discussions emphasizing the impact of human production systems on community and the local and global environment.
- Describing, analyzing, and critiquing the roles and impacts of human activity and technology on both human society and the natural world through an evaluation of the delicate

balance between the needs and desires of a growing population and the natural resources required to meet these demands in the future.

- Devising informed and meaningful responses to problems and arguments in sustainability based on the interpretation of appropriate evidence and an explicit statement of values. Knowledge gained will provide students with the understanding required to evaluate the impact on sustainability for a variety of conventional and 'unconventional' production systems. The experiences from the course will allow the student to make informed decisions about the impact of these practices on sustainability."

"*Goal 1: Successful students will analyze sustainability at a more advanced and in-depth level than in the Foundations component.*
1.1 *Engage in critical and logical thinking about the topic or idea of sustainability*."

Students will engage in critical and logical thinking about the topic of sustainability through a series of lectures addressing a variety of sustainability topics during the semester.

In response to the comments from the Committee, this course will focus on 7 sub-components of sustainability, namely:

a. ecological paradigm for sustainability
b. biodiversity
c. greenhouse gases (CO_2)
d. environmental impacts of N & P
e. environmental impacts of agrichemicals
f. environmental impacts – water
g. food production (and other uses of plants)

The syllabus is modified as follows:

1. The first course goal is modified to explicitly state the role of these 7 sustainability topics within the course. Lectures will focus on consideration of these 7 sub-components of sustainability.
2. The writing assignment associated with the plant collection will be expanded to require that students consider the implications of that plant species for sustainability (See Page 8)
3. The list of Course Topics (Table on Page 14 of Syllabus) is modified with an additional Column that clarifies which sub-component is addressed by each lecture unit.
4. A detailed list of 7 sustainability sub-component topics is added as the final page of the syllabus (Page 16), that adds detail for each sustainability topic, and the Teaching Unit that is addressed by that topic.

The weekly writing assignments (PackBack) will be revised (see P7) to give greater emphasis to sustainability and the seven sustainability sub-components. In each 2-week period, the PackBack theme will comprise a) consideration of the biophysical information presented in class (first week), and b) consideration of related sustainability sub-theme (see Page 16) (second week).

The plant collection will be revised to allow students to include detail of the role of that species in sustainability. In many cases, the role of a species to sustainability might not be clear, and students will require critical and logical thinking to make a determination as to what that role might be (for example, weedy species might have a negative contribution to production, but a positive contribution to biodiversity)

The Mid-term and final exam use short answer questions, focused on biophysical knowledge. Each exam will include a question in which students will need to describe the ecological paradigm used in this course, and apply that, using specific examples, to a production system they are familiar with.

"*Goal 1.2 Engage in an advanced, in-depth, scholarly exploration of the topic or idea of sustainability*."

It is the view in this course, that sustainability within a plant production system (whether for food, fuel, fiber, or recreation) is not a single, isolated topic, but a series of issues that are superimposed within a system. We develop the ecological paradigm for sustainability (See Module 1 Week 1) that includes social, economic and biophysical (environmental) components. Hypothetically, and system that is socially and economically viable, but not biophysically viable would not be sustainable.

The syllabus has been revised to include focus on 7 sub-components of sustainability that are most relevant to managed ecosystems. The lectures develop an advanced, in-depth, scholarly exploration of these 7 sub-components. "Advanced" and "in-depth" are subjective terms however, this course will be a continuation from HCS2201 in which students appear adequately challenged with the depth of course content. This course has no pre-requisites, so it is designed for students with no prior background in science. Some students (non-majors) mention difficulty with scientific terminology in prior SEI feedback, and this has been addressed with development of a 23-page course packet (Knowledge Packet). We assume basic scientific understanding (i.e. are familiar with the Periodic Table, are familiar with simple organic compounds, sugars vs proteins vs fats etc, are familiar with metric terminology). Students with a weak scientific background are encouraged to review the Knowledge packet, or consult a basic scientific text for additional information.

In some cases, a lecture topic might address several sub-components, for example: Fertilizer use in Unit 10, i) affects greenhouse gases through greater plant growth increasing carbon sequestration, but also potentially increasing some greenhouse gases, ii) can have negative off-site impacts from leaching to surface waters, and iii) increased food production. Students will critical and logical thinking in the analysis of complexity from positive and negative feedback systems within the context of plant production.

"*Goal 2: Successful students will integrate approaches to sustainability by making connections to out-of- classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future. 2.1 Identify, describe and synthesize approaches or experiences as they apply to sustainability*."

Throughout this course, students are encouraged to relate their own personal experiences to content that is delivered in lectures. This course addresses biophysical aspects of plants used for a variety of purposes; whether through food that is consumed, bio-fuels, plant fibers, or plants used for recreational purposes, students have an intimate relationship with plants and through the lecture content, relate their personal plant experience to academic knowledge of how these plants are grown and managed. In addition to mere sustenance, many student ethical and personal life-style choices will have implications for plant production (e.g. organic food, vegetarian, fuel choice in vehicles, dietary control, recycling preferences), and aspects of the lecture will address these individual personal choices.

Students engage in 'out-of-classroom' experiences using two primary mechanisms:

1) Identifying, describing, and photographing 15 plant species, and describing the impact of each species on the sustainability of the agroecosystem. Plants are selected from the sphere of each student's experience – whether a traditional production system, plants 'from Grandma's garden', plants used during cooking, or in one unique case – plants used in witchcraft for making potions and spells!! All options illustrate plants with a useful purpose. In addition to their photographic collection, students engage in a writing exercise to describe their selected species. The Syllabus is now revised to include consideration of the role of that species to sustainability.

2) Throughout the semester, students will submit written observations of sustainable (or not) practices and responses to questions posed by their classmates that relate to topics raised in lectures each week. These interactions will allow students to build on their knowledge throughout the semester.
   Writing will be submitted using the Third-party platform "PackBack". One question selected by each student (1 paragraph), and two responses to questions from others (1 paragraph, each) on topics related to the week's lectures will be required per week (due Sunday 11:59 pm). In each 2-week period, the PackBack theme will comprise a) consideration of the biophysical information presented in class (first week), and b) consideration of related sustainability sub-theme (see Page 17) (second week). Grading will be assigned by PackBack based on the quality of the questions and answers. When students reply on published work, the citation should be included.

"*Goal 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts*."

Throughout this course, students will demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts. Throughout the semester, students will submit written observations of sustainable (or not) practices and responses to questions posed by their classmates that relate to topics raised in lectures each week. These interactions will allow students to build on their knowledge throughout the semester.

The PackBack platform provides a mechanism for students to practice and improve their writing. PackBack provides a 'curiosity score' for each paragraph submitted that evaluates sentence complexity and use of technical terminology. Students can self-evaluate by submitting draft text that is assessed, and can be revised and improved prior to submission.

"*Goal 3: Successful students will analyze and explain how social and natural systems function, interact and evolve over time; how human well-being depends on these interactions; how actions have impacts on subsequent generations and societies globally; and how human values, behaviors and institutions impact multifaceted potential solutions across time.*
3.1 Describe elements of the fundamental dependence of humans on Earth and environmental systems, and on the resilience of these systems."

This course focuses on the biophysical components of managed plant production systems. Whether plants are produced for direct consumption (food), for fuel (e.g. biofuel), fiber (cotton, hemp), medicinal use, or for recreations pursuits such a sports turf, ornamental use (gardens) or even parks, humans have developed a complex interaction with plants that has become implicit in every facet of our well-being. Plants are integrated into Western culture (Easter lilies, Valentine roses, popcorn at movies, French fries, Christmas trees), with many parallel examples of plant use in other cultures. One unfortunate aspect of our culture is a poor understanding of how these plants are produced and managed. In many cases it is this plant production that has directly affected our own world, with an estimated 25% of atmospheric CO_2 being derived from agricultural sources. Student will develop a sense of this relationship in the lectures, and have opportunity to explore and question these concepts in weekly writing assignments.
One unifying aspect of all cultures is we eat the plants we grow!!

"*Goal 3.2 Describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, present and future*."

The relationship between development human society and plant evolution is a classic example of co-evolution; where two species change concurrently. For example, in the past it is doubtful whether modern hexaploid wheat would have developed without assistance from mankind, and it is equally speculative whether human society could have developed without parallel increases in agricultural output resulting from crop selection, tillage, irrigation and weed control.

Human society in simplicity integrated with plant production. We produce food for consumption, burn biofuels in our vehicles, wear clothes from cotton (or not!!), and are dependent on plants for our recreation and leisure. While most students have some understand of plant growth (perhaps a house plant in their apartment, or a vegetable project as a child), few students have a detailed understanding of commercial production of plants.

Currently, it is speculative what effects our agricultural practices such as nitrogen use, loss of soil organic matter, and elevated CO_2 have contributed to climate change. It is also speculative what the effects of climate change might have on agricultural production. The future for agricultural production is uncertain.

Throughout the semester, students will learn details of the relationships between plants and human society. The rise in global population to a projected 10 billion people is dependent on a parallel increase in agriculture production. Maintaining that production is dependent on managing every facet of the plants environment. Plant genetics (including GMO's), soil fertility and health, adapting the climate through irrigation and wind control, elimination of competing organisms (weeds, insects, disease) are all components of a modern production system, but all come with the potential for off-site impacts including loss of biodiversity, eutrophication of surface waters, impact on green-house gases to name a few. Students have opportunity to analyze and critique these impacts in weekly writing assignments (using the PackBack platform).

"*Goal 3.3 Devise informed and meaningful responses to problems and arguments in the area of sustainability based on the interpretation of appropriate evidence and an explicit statement of values*."

Throughout this course, knowledge gained by students will allow their understanding of some of the issues related to agricultural production, and allow their evaluation of the impact on sustainability for a variety of conventional and 'unconventional' production systems. The experiences from the course will allow the student to make informed decisions about the impact of these practices on sustainability.

"***Contingency: The reviewing faculty request that a cover letter be provided that details all changes made to the proposal in response to the reviewing faculty's feedback and requests***."

Refer to this letter.

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"***Recommendations: The reviewing faculty recommend that the listed course topics better reflect sustainability content that is within the course schedule but not included in the course topic list***."

The Syllabus has been revised to focus on 7 specific sub-components of sustainability. These are listed in briefly within Learning Goal 1, and are described in greater detail, along with which Course Unit(s) addresses each sub-component of sustainability, in a new Table at the end of the syllabus (Page 16).

Sincerely,

Dr David Barker
Professor

Ecology of Managed Plant Systems

HCS2204 Autumn 2022

Course Information

- **Course times and location:** Three 55-min lectures, MWF 9:10-10:05 am, Kottman Hall Room 103
- **Credit hours:** 3
- **Mode of delivery:** In person

Instructor

Dr David Barker,
Email: barker.169@osu.edu
Phone: 614-247-6258
226 Kottman Hall
Office hours: TBD

- **Preferred contact method:** First contact with any instructor should be an Ohio State email address. Students should receive a response within **24 hours** on weekdays.

Teaching Assistant

- **TBD**

Course Prerequisites

None

Course Exclusions

HCS2201

Course Description

Origin, diversification, and biogeography of plants inhabiting managed landscapes.

Learning Outcomes

On completion of this course, students will:

1. Understand sustainability from a biophysical perspective, related to the following 7 sustainability issues applicable to managed plant ecosystems:
    a. ecological paradigm for sustainability
    b. biodiversity
    c. greenhouse gases (CO_2)
    d. environmental impacts of N & P
    e. environmental impacts of agrichemicals
    f. environmental impacts – water
    g. food production (and other uses of plants)

2. Understand the biotic and abiotic factors influencing production of food, fiber and fuel from managed ecosystems
3. Be able to recognize and describe the characteristics of representative families and genera found in croplands, forests, and urban/suburban landscapes.

2. Be familiar with the basic principles and concepts of taxonomy, phylogeny, evolution, genetics and speciation as they relate to crops, ornamental plants, and weeds.

General Education Goals and Expected Learning Outcomes

As part of the Sustainability Theme of the General Education curriculum, this course is designed with the following Goals and Expected Learning Outcomes:

Goal 1: Successful students will analyze sustainability at a more advanced and in-depth level than in the Foundations component.

1.1 Engage in critical and logical thinking about the topic or idea of sustainability.
1.2 Engage in an advanced, in-depth, scholarly exploration of the topic or idea of sustainability.

Goal 2: Successful students will integrate approaches to sustainability by making connections to out-of- classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.

2.1 Identify, describe and synthesize approaches or experiences as they apply to sustainability.
2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment and creative work, building on prior experiences to respond to new and challenging contexts.

Goal 3: Successful students will analyze and explain how social and natural systems function, interact and evolve over time; how human well-being depends on these interactions; how

actions have impacts on subsequent generations and societies globally; and how human values, behaviors and institutions impact multifaceted potential solutions across time.

3.1 Describe elements of the fundamental dependence of humans on Earth and environmental systems, and on the resilience of these systems.

3.2 Describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, present and future.

3.3 Devise informed and meaningful responses to problems and arguments in the area of sustainability based on the interpretation of appropriate evidence and an explicit statement of values.

This course fulfills the General Education learning objectives for the Sustainability Theme by:

- Engaging in critical and logical thinking about the topic of sustainability through a series of lectures, discussions, and writing (PackBack) with a focus on sustainability and managed plant ecosystems (i.e. the agroecosystem). Weekly reflective writing assignments will require the students to study and understand the agroecosystem, and the genetic, biotic and abiotic factors affecting the plant we use.
- Engaging in an advanced, in-depth, and scholarly exploration through a semester-long study of the variety of agroecosystems used in western and global communities.
- Identifying, describing, and photographing 15 plant species, and describing the impact of each species on the sustainability of the agroecosystem.
- Demonstrating a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts. Throughout the semester, students will submit written observations of sustainable (or not) practices and responses to questions posed by their classmates that relate to topics raised in lectures each week. These interactions will allow students to build on their knowledge throughout the semester.
- Describing elements of the fundamental dependence of humans on Earth and environmental systems, and on the resilience of these systems through lectures and discussions emphasizing the impact of human production systems on community and the local and global environment.
- Describing, analyzing, and critiquing the roles and impacts of human activity and technology on both human society and the natural world through an evaluation of the delicate balance between the needs and desires of a growing population and the natural resources required to meet these demands in the future.
- Devising informed and meaningful responses to problems and arguments in sustainability based on the interpretation of appropriate evidence and an explicit statement of values. Knowledge gained will provide students with the understanding required to evaluate the impact on sustainability for a variety of conventional and ‘unconventional’ production systems. The experiences from the course will allow the student to make informed decisions about the impact of these practices on sustainability.

How This Course Works

Mode of delivery: This course is in person. Three lecture sessions per week will be delivered in person.

Credit hours and work expectations: This is a 3-credit-hour course. According to Ohio State bylaws on instruction (go.osu.edu/credit hours), students should expect around 3 hours per week of time spent on direct instruction in addition to 6 hours of homework to receive a grade of C average.

Attendance and participation requirements: Research shows regular participation is one of the highest predictors of success. With that in mind, we expect that students will attend class and regularly contribute to discussions. If you're unable to attend class, the mid-term exam, or meet any of the required deadlines due to a health or personal issue, please contact Dr Barker to determine what make-up options there might be.

Course Materials, Fees, and Technologies

Required Materials and/or Technologies

Textbooks/Readings:

Required

- all required reading materials are posted in Carmen

Optional

- Plant Science – Growth Development and Utilization of Cultivated Plants 5th ed. McMahon, Kofranek & Rubatzky. Publ. Prentice Hall
- Additional resources are posted in Carmen

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection.
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If the student does not have access to the technologies, options for technology and internet access (go.osu.edu/student-tech-access) should be considered.

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the installing Office 365 (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

Each student will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access this course in Carmen. To ensure connection to Carmen, the following is recommended:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device (go.osu.edu/add-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.
- Install the Duo Mobile application (go.osu.edu/install-duo) on 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 these options do not work, contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will provide a solution.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- Navigating CarmenCanvas (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)
- Recording a slide presentation with audio narration and recording, editing and uploading video (go.osu.edu/video-assignment-guide)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat**: go.osu.edu/it
- **Phone:** 614-688-4357 (HELP)
- **Email:** servicedesk@osu.edu

PackBack Questions

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 community where you can be fearlessly curious and ask open-ended questions to build on top of what we are covering in class and relate topics to real-world applications.

Packback Requirements:

Your participation in PackBack will count toward 25% of your overall course grade.

The deadline will be Sunday at 11:59 pm EST for weekly 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 threshold Curiosity Score of 60, each worth 5pts of each assignment grade
- 2 Responses per week with a threshold Curiosity Score of 60, each worth 10pts of each assignment grade

- Pro-rated credit will be provided for questions and responses that do not meet the minimum curiosity score.

How to Register on Packback:

An email invitation will be sent to you from help@packback.co prompting you to finish registration. If you don't receive an email (be sure to check your spam), you may register by following the instructions below:

1. Create an account by navigating to https://questions.packback.co and clicking "Sign up for an Account"

Note: If you already have an account on Packback you can log in with your credentials.

2. Then enter our class community's lookup key into the "Looking to join a community you don't see here?" section in Packback at the bottom of the homepage.

Community Lookup Key: 20eef42e-6763-4be7-9466-8e63a91da6eb

3. Follow the instructions on your screen to finish your registration.

Packback may require a paid subscription. Refer to www.packback.co/product/pricing for more information.

How to Get Help from the Packback Team:

If you have any questions or concerns about Packback throughout the semester, please read their FAQ at help.packback.co. If you need more help, contact their customer support team directly at help@packback.co.

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

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points
Weekly Reports - PackBack (13 questions and 26 responses) (weekly)	25
Examinations Mid-semester (7th week of semester) Final	 25 25
Plant Collection (9th week of semester)	25
Total	100

See Course Schedule in Carmen for due dates.

Descriptions of Major Course Assignments

Weekly Reports (25%)

Description: One question of your own (1 paragraph), and two responses to questions from others (1 paragraph, each) on topics related to the week's lectures are required per week (due Sunday 11:59 pm). In each 2-week period, the PackBack theme will comprise a) consideration of the biophysical information presented in class (first week), and b) consideration of related sustainability sub-theme (see Page 17) (second week). Grading will be assigned by PackBack based on the quality of the questions and answers. When you rely on published work, the citation should be included.

Academic integrity and collaboration: All written weekly reports must be the original work of the student.

Examinations (25% each)

Description: One mid-semester examination will take place in class during the 7th week of the semester, and one final examination will take place during the university assigned time for this course. The exams will include questions based on information presented and discussed throughout the semester as identified in the Course Schedule.
Academic integrity and collaboration: All answers to examination questions must be the original work of the student.

Plant collection (25%)

Description: An original collection of 15 plant species is required for each student. These plants must represent at least 8 plant families. The collection should comprise digital photographs of the plant; comprising 1 photograph of the complete plant, and 1 close-up photograph of anatomical plant features (flowers, leaves, bark, roots, specialized structures). The collection should be compiled as a Power-Point file, with annotations, and uploaded to Carmen, during the 9th week. Grading the collection will be based on correctness of identification, quality of photographs, and a written description. The plant collection will include labelled photographs, a 100-word written description for each species, and a 120-word description for 8 families. This written description can include a consideration of the role of that species to sustainability. Additional detail about the suitable species and tips for writing will be provided in class. When you rely on published work, the citation should be included.

Academic integrity and collaboration: All photographs and written descriptions must be the original work of the student.

Late Assignments

Due dates for weekly PackBack reports are on Sunday 11:59 pm of every week beginning with the second week of the semester. In case of emergencies and other circumstances that prevent you from turning in an assignment on time, please contact Dr. Barker as soon as possible by email. Official documentation (e.g., from a doctor's office, hospital or interviewer) might be required.

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-HELP** at any time if you have a technical problem.)

- **Preferred contact method:** First contact should be at Ohio State email address. Students should receive a response within **24 hours** on weekdays.
- **Class announcements:** All important class-wide messages will be posted on the Announcements tool in CarmenCanvas.
- **Grading and feedback:** Grades for all assignments submitted before the due date will be posted within seven days. Additional feedback on assignment and grades will be arranged through an appointment. Assignments submitted after the due date may have reduced feedback and grades may take longer to be posted.

Grading Scale

93–100: A	83–86.9: B	70–72.9: C-
90–92.9: A-	80–82.9: B-	67–69.9: D+
87–89.9: B+	77–79.9: C+	60–66.9: D
	73–76.9: C	Below 60: E

Other Course Policies

Discussion and Communication Guidelines

The following are our 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. 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.

E-Mail 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. I will not respond to e-mails that I consider inappropriate. I will respond to appropriate emails in a timely manner, do not expect an immediate reply.

<u>DO</u>

- 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.

<u>DON'T</u>

- 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.

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.

Copyright for Instructional Materials

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.

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.

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://equity.osu.edu/.

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.

For students in CFAES, 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.

For all students at OSU, 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

Accessibility Accommodations for Students with Disabilities

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 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)

This course uses video and audio recordings of class lectures, student presentations, and related materials. These recordings are available to all students presently enrolled in the course. Please note that you are not allowed to share these recordings. This is to protect your FERPA rights and those of your fellow students.

Health & Safety Requirements:

Health and safety requirements: All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (https://safeandhealthy.osu.edu). Non-compliance will result in a warning first, and disciplinary actions will be taken for repeated offenses.

Land Acknowledgement Statement (adapted from Michael V. Drake Institute for Teaching and Learning, https://drakeinstitute.osu.edu/about/mission-vision-values-and-goals)

We would like to acknowledge the land that The Ohio State University occupies is the ancestral and contemporary lands of the Shawnee, Potawatomi, Delaware, Miami, Peoria, Seneca, Wyandotte, Ojibwe and Cherokee peoples. The university resides on land ceded in the 1795 Treaty of Greeneville and the forced removal of tribes through the Indian Removal Act of 1830. We honor the resiliency of these tribal nations and recognize the historical contexts that have and continue to affect the Indigenous peoples of this land.

Course Schedule

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

	Topic	**Week**	**Text Reading** McMahon 5th ed	Sustainability topic (see Learning Goal 1)
	Unit I: Introduction to Agroecology	1	Ch 1 (p 2-16)	1. ecological paradigm
Plant Diversity	Unit II: Classification & Systematics	2	Ch 10 (p 198-199)	2. biodiversity
	Unit III: Origins & Domestication	3	Ch 10 (p 205-214)	2. biodiversity
	Unit IV: Basic Genetics & Breeding	3-4	Ch 9 (p 158-167)	2. biodiversity 7. food production
	Unit V: GMOs	4-5	Ch 9 (p 166)	2. biodiversity 5. env. impact – chemicals 7. food production
	Unit VI: Plant variation & Cultivars	5-6	Ch 10 (p 215-219)	2. biodiversity 7. food production
	Unit VII. Agricultural Experimentation	7	Ch 1 (p 11-15)	
Abiotic Factors	Unit VIII: Climate and Weather Systems	8	Ch 4 (p 45-47)	3. greenhouse gases 6. env. impact - water
	Unit IX: The Plant Environment	9	Ch 4 (p 48-56)	3. greenhouse gases 6. env. impact - water
	Unit X: Nutrients & Soil	10-11	Ch 5 (p 62-76) Ch 13 (p251-264)	3. greenhouse gases 4. env. impact - nutrients 6. env. impact - water
Biotic Factors	Unit XI: Interactions Between Organisms (competition, insects, disease, weeds)	12-13	Ch 15 (p 296-339)	5. env. impact – chemicals 7. food production
Production Systems	Unit XII: Structure of Managed Ecosystems	13	Ch 2 (p 17-32)	7. food production
	Unit XIII: Plants and People	13-14	Ch 3 (p 33-44)	7. food production

Topics:

Unit I. **Introduction to Agroecology:** Population, community, agro-ecosystem, ecological paradigm, sustainability, ecological footprint.

Unit II. **Plant classification and systematics:** 2 classes (monocots, dicots), 8 families (Apiaceae, Asteraceae, Brassicaceae, Fabaceae, Lamiaceae, Poaceae, Rosaceae, Solanaceae), Latin binomial nomenclature, Carl Linnaeus.

Unit III. **Origins and domestication:** Plant centers of origin, fertile crescent, plant diversity, genebanks, crop domestication (corn, wheat, barley, ornamentals), co-evolution, paleobotany, Nicolai Vavilov.

Unit IV. **Basic Genetics & Breeding:** DNA, replication, chromosomes, ploidy, genes, mutation, plant breeding, introduction, selection, hybridization, breeding systems, Gregor Mendel.

Unit V. **GMOs:** history of use, transgenic crops, Bt, Round-up Ready, transformation methods (agrobacterium, electroporation, biolistics), tissue culture.

Unit VI. **Plant variation & Cultivars:** Ecotypes, landraces, heirloom, public and private cultivars, plant variety rights.

Unit VII. **Experimentation and Research:** control, replication, hypothesis, treatments, statistical analysis (variation, regression, correlation), Ronald Fisher, long-term research, scientific publication.

Unit VIII. **Climate and Weather Systems:** Coriolis effect, global radiation, 7 biomes (desert, grassland, tropical forest, deciduous forest, tundra, tiaga, temperate evergreen forest).

Unit IX. **The Plant Environment:** Abiotic factors, temperature, degree days, hardiness zones, water, irrigation, drought, hydrological cycle, wind.

Unit X. **Nutrients & Soil:** Nitrogen fixation, soil taxonomy, horizons, soil-less media, soil texture, soil forming factors, parent material, organic matter, C:N ratio, CEC, pH, Jethro Tull, deficiency symptoms, lime, N, P, K, S.

Unit XI. **Interactions Between Organisms:** Competition, mechanisms of competition, symbiosis, mutualism, insects, insect orders, disease, weeds, weed functional groups, weed control, IPM.

Unit XII. **Structure of Managed Ecosystems:** Sustainability, biodiversity, trophic levels, Shannon's index, soil biology.

Unit XIII. **Plants and People:** Roots and root crops, plant bioproducts, world and USA crop trends, fermentation/ethanol, biodiesel, biopolymers, recreational plants, plants and culture, 'fate of nations'.

Sustainability topics

1. Ecological paradigm for sustainability: economic, biophysical, social (prices, plants, people)

What is the ecological paradigm, and how does this relate to sustainability?

TOPICS

- Unit 1 lectures

2. Biodiversity (local and global) GMO crops

What is the relationship between biodiversity (genetic diversity, species diversity, alpha & beta diversity) and food supply?

TOPICS

- Units 2-6 lectures
- Unit 12 lectures

3. Agriculture and greenhouse gases
    - CO_2 and soil carbon
    - Methane

What is the relationship between agriculture and greenhouse gasses.. impact of greenhouses gases on agriculture, and impact of agriculture on greenhouse gases?

TOPICS

- Units 9 & 10

4. Environmental impacts – nutrients (N, P)

What is the relationship between agriculture and nutrient supply.. impact of nutrients on agriculture, and impact of agriculture on (off-site) nutrients?

TOPICS

- Unit 10

5. Environmental impacts – agrichemicals

Role and impacts of agrichemicals (nutrients, herbicides, fungicides, insecticides)

TOPICS

- Units 5 & 11

6. Environmental impacts – water

Role of water in agriculture (Ohio, vs locations with marginal water)

TOPICS

- Unit 9

7. Global (and local) food security

Can we feed 10 billion people??

TOPICS

- Units 12-13

GE THEME COURSES

Overview

Courses that are accepted into the General Education (GE) Themes must meet two sets of Expected Learning Outcomes (ELOs): those common for all GE Themes and one set specific to the content of the Theme. This form begins with the criteria common to all themes and has expandable sections relating to each specific theme.

A course may be accepted into more than one Theme if the ELOs for each theme are met. Courses seeing approval for multiple Themes will complete a submission document for each theme. Courses seeking approval as a 4-credit, Integrative Practices course need to complete a similar submission form for the chosen practice. It may be helpful to consult your Director of Undergraduate Studies or appropriate support staff person as you develop and submit your course.

Please enter text in the boxes to describe how your class will meet the ELOs of the Theme to which it applies. Please use language that is clear and concise and that colleagues outside of your discipline will be able to follow. You are encouraged to refer specifically to the syllabus submitted for the course, since the reviewers will also have that document Because this document will be used in the course review and approval process, you should be *as specific as possible*, listing concrete activities, specific theories, names of scholars, titles of textbooks etc.

HCS2204

Course subject & number

General Expectations of All Themes

GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.

Please briefly identify the ways in which this course represents an advanced study of the focal theme. In this context, "advanced" refers to courses that are e.g., synthetic, rely on research or cutting-edge findings, or deeply engage with the subject matter, among other possibilities. *(50-500 words)*

Students will engage in an advanced, in-depth, and scholarly exploration through a semester-long study of the variety of agroecosystems used in western and global communities. The course has three components; i) applied genetics; familiarity with the basic principles and concepts of taxonomy, phylogeny, evolution, and speciation as they relate to crops, ornamental plants, and weeds (Course Goal 2). ii) basic abiotic factors affecting plant production, including climate and growth media, iii) biotic components affecting plant production including plant pests, plant competition, and the human dimensions of food, fiber and fuel from managed ecosystems (Course Goal 3)

Course subject & number HCS2204

ELO 1.1 Engage in critical and logical thinking about the topic or idea of the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. (50-700 words)

The weekly writing assignments (PackBack) will be revised (see P7) to give greater emphasis to sustainability and the seven sustainability sub-components. In each 2-week period, the PackBack theme will comprise a) consideration of the biophysical information presented in class (first week), and b) consideration of related sustainability sub-theme (see Page 16) (second week).

The plant collection will be revised to allow students to include detail of the role of that species in sustainability. In many cases, the role of a species to sustainability might not be clear, and students will require critical and logical thinking to make a determination as to what that role might be (for example, weedy species might have a negative contribution to production, but a positive contribution to biodiversity)

The Mid-term and final exam use short answer questions, focused on biophysical knowledge. Each exam will include a question in which students will need to describe the ecological paradigm used in this course, and apply that, using specific examples, to a production system they are familiar with.

ELO 1.2 Engage in an advanced, in-depth, scholarly exploration of the topic or idea of the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

It is the view in this course, that sustainability within a plant production system (whether for food, fuel, fiber, or recreation) is not a single, isolated topic, but a series of issues that are superimposed within a system. We develop the ecological paradigm for sustainability (See Module 1 Week 1) that includes social, economic and biophysical (environmental) components. Hypothetically, and system that is socially and economically viable, but not biophysically viable would not be sustainable.

The syllabus has been revised to include focus on 7 sub-components of sustainability that are most relevant to managed ecosystems. The lectures develop an advanced, in-depth, scholarly exploration of these 7 sub-components. “ Advanced ” and “ in-depth ” are subjective terms however, this course will be a continuation from HCS2201 in which students appear adequately challenged with the depth of course content. This course has no pre-requisites, so it is designed for students with no prior background in science. Some students (non-majors) mention difficulty with scientific terminology in prior SEI feedback, and this has been addressed with development of a 23-page course packet (Knowledge Packet). We assume basic scientific understanding (i.e. are familiar with the Periodic Table, are familiar with simple organic compounds, sugars vs proteins vs fats etc, are familiar with metric terminology). Students with a weak scientific background are encouraged to review the Knowledge packet, or consult a basic scientific text for additional information.

In some cases, a lecture topic might address several sub-components, for example: Fertilizer use in Unit 10, i) affects greenhouse gases through greater plant growth increasing carbon sequestration, but also potentially increasing some greenhouse gases, ii) can have negative off-site impacts from leaching to surface waters, and iii) increased food production. Students will critical and logical thinking in the analysis of complexity from positive and negative feedback systems within the context of plant production.

Course subject & number HCS2204

GOAL 2: Successful students will integrate approaches to the theme by making connections to out-of-classroom experiences with academic knowledge or across disciplines and/or to work they have done in previous classes and that they anticipate doing in future.

ELO 2.1 Identify, describe, and synthesize approaches or experiences as they apply to the theme. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Throughout this course, students are encouraged to relate their own personal experiences to content that is delivered in lectures. This course addresses biophysical aspects of plants used for a variety of purposes; whether through food that is consumed, bio-fuels, plant fibers, or plants used for recreational purposes, students have an intimate relationship with plants and through the lecture content, relate their personal plant experience to academic knowledge of how these plants are grown and managed. In addition to mere sustenance, many student ethical and personal life-style choices will have implications for plant production (e.g. organic food, vegetarian, fuel choice in vehicles, dietary control, recycling preferences), and aspects of the lecture will address these individual personal choices.

Students engage in 'out-of-classroom' experiences using two primary mechanisms:
1) Identifying, describing, and photographing 15 plant species, and describing the impact of each species on the sustainability of the agroecosystem. Plants are selected from the sphere of each student's experience – whether a traditional production system, plants 'from Grandma's garden', plants used during cooking, or in one unique case – plants used in witchcraft for making potions and spells!! All options illustrate plants with a useful purpose. In addition to their photographic collection, students engage in a writing exercise to describe their selected species. The Syllabus is now revised to include consideration of the role of that species to sustainability.

2) Throughout the semester, students will submit written observations of sustainable (or not) practices and responses to questions posed by their classmates that relate to topics raised in lectures each week. These interactions will allow students to build on their knowledge throughout the semester.
Writing will be submitted using the Third-party platform "PackBack". One question selected by each student (1 paragraph), and two responses to questions from others (1 paragraph, each) on topics related to the week's lectures will be required per week (due Sunday 11:59 pm). In each 2-week period, the PackBack theme will comprise a) consideration of the biophysical information presented in class (first week), and b) consideration of related sustainability sub-theme (see Page 17) (second week). Grading will be assigned by PackBack based on the quality of the questions and answers. When students reply on published work, the citation should be included.

ELO 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Society (including students) engage with plants at multiple levels. Whether through direct and active involvement, such as propagation of house plants, gardening, employment in the production sector(s), tangential involvement such as an interest in food or recreational activities, or indirect and passive involvement through respiration of oxygen, eating or contribution to the human footprint, students utilization of plants is unique and personal. Throughout the course, weekly writing assignments allow students to reflect on their utilization of plant materials, the impact this might have on how those materials are produced, and the potential impacts that production might have at local and global scales.

The PackBack platform provides a mechanism for students to practice and improve their writing. PackBack provides a 'curiosity score' for each paragraph submitted that evaluates sentence complexity and use of technical terminology. Students can self-evaluate by submitting draft text that is assessed, and can be revised and improved prior to submission.

Course subject & number HCS2204

Specific Expectations of Courses in Sustainability

GOAL 1: Students analyze and explain how social and natural systems function, interact, and evolve over time; how human wellbeing depends on these interactions; how actions have impacts on subsequent generations and societies globally; and how human values, behaviors, and institutions impact multi-faceted, potential solutions across time.

1.1 Describe elements of the fundamental dependence of humans on Earth and environmental systems and on the resilience of these systems. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Humans (including students) are fundamentally dependent on cultivated plants for food, fuel, fiber and recreational pursuits. Co-evolution of human culture and plant cultivation has occurred during the last 10,000 years, and continues today as human society and plant culture are intrinsically inter-connected. Human cultivation of plants is not coincidental, and the biophysical relationships between the necessary inputs and desired outputs are stochastically predicable. During this course, students will gain an introductory appreciation of the scope for manipulation of plant culture (Course learning goals 1-4). This production does not come without issues. Production is not necessarily equitable, and the quantity and quality of production varies globally, and among demographic groups within USA. This production does not happen without inputs such as labor, nutrients, and abiotic (climatic) factors, many of which have an economic impact on local and global communities. The optimum level of these inputs invariably varies from the maximum levels possible. This production does not happen without both positive and negative impacts on the environment. Course Learning Goal 3, describes biophysical relationships of inputs and outputs (production, and environmental impact) that will be explored by students during this course.

Course subject & number HCS2204

1.2 Describe, analyze and critique the roles and impacts of human activity and technology on both human society and the natural world, in the past, currently, and in the future. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

The relationship between development human society and plant evolution is a classic example of co-evolution; where two species change concurrently. For example, in the past it is doubtful whether modern hexaploid wheat would have developed without assistance from mankind, and it is equally speculative whether human society could have developed without parallel increases in agricultural output resulting from crop selection, tillage, irrigation and weed control.

Human society in simplicity integrated with plant production. We produce food for consumption, burn biofuels in our vehicles, wear clothes from cotton (or not!!), and are dependent on plants for our recreation and leisure. While most students have some understand of plant growth (perhaps a house plant in their apartment, or a vegetable project as a child), few students have a detailed understanding of commercial production of plants.

Currently, it is speculative what effects our agricultural practices such as nitrogen use, loss of soil organic matter, and elevated CO2 have contributed to climate change. It is also speculative what the effects of climate change might have on agricultural production. The future for agricultural production is uncertain.

Throughout the semester, students will learn details of the relationships between plants and human society. The rise in global population to a projected 10 billion people is dependent on a parallel increase in agriculture production. Maintaining that production is dependent on managing every facet of the plants environment. Plant genetics (including GMO's), soil fertility and health, adapting the climate through irrigation and wind control, elimination of competing organisms (weeds, insects, disease) are all components of a modern production system, but all come with the potential for off-site impacts including loss of biodiversity, eutrophication of surface waters, impact on green-house gases to name a few. Students have opportunity to analyze and critique these impacts in weekly writing assignments (using the PackBack platform).

1.3 Devise informed and meaningful responses to problems and arguments in the area of sustainability based on the interpretation of appropriate evidence and an explicit statement of values. Please link this ELO to the course goals and topics and indicate *specific* activities/assignments through which it will be met. *(50-700 words)*

Informed and meaningful responses to problems affecting sustainable use of plants for food, fiber, fuel and recreational purposes can be based on greater understanding of the relationships between inputs and outputs of production. Although sustainability will be consider the three components: economic, social and biophysical, emphasis will be placed on biophysical factors affecting sustainable plant production. Throughout this course, students will explore the difference between optimized and maximized production; optimum levels of production rarely occur at maximum production. Solutions to sustainability might include redefinition of the criteria for optimization. Production systems are invariably complex and may fulfill multiple ecosystem services (for example, food supply as well as carbon sequestration). Improvements to one ecosystem service may not be beneficial to another. Emphasis will be placed on use of appropriate sources of evidence, and consideration given to the quality of evidence.

Subject: FW: Concurrence Request for HCS 2204/2205
Date: Friday, January 14, 2022 at 11:59:34 AM Eastern Standard Time
From: Osborne, Jeanne
To: Luikart, Meredith
CC: Barker, David
Attachments: image002.jpg, image003.png

Meredith,

Concurrence from FCOB.

Take care,

Jeanne

From: Prud'homme, Andrea <prudhomme.3@osu.edu>
Sent: Friday, January 14, 2022 11:05 AM
To: Osborne, Jeanne <osborne.2@osu.edu>
Subject: RE: Concurrence Request for HCS 2204/2205

Jeanne:

This is so far from anything we do in Fisher that there is zero concern or concurrence with anything we have.

Andrea

Andrea M. Prud'homme, PhD, CPIM-F, CSCP, CLTD, CIRM
200D Fisher Hall
Fisher College of Business
Associate Dean Undergraduate Programs & Students
Associate Professor – Clinical, Dept. of Operations & Business Analytics
614.292.3173 Office
Pronouns: she/her/hers

From: Osborne, Jeanne <osborne.2@osu.edu>
Sent: Thursday, January 13, 2022 4:03 PM
To: Prud'homme, Andrea <prudhomme.3@osu.edu>
Cc: Luikart, Meredith <luikart.6@osu.edu>; Barker, David <barker.169@osu.edu>; Gardner, David <gardner.254@osu.edu>
Subject: Concurrence Request for HCS 2204/2205

Dear Dr. Prud'homme,

Good evening!

Attached please find the syllabi and concurrence requests from the Department of Horticulture and Crop Science in CFAES for a pair of new courses, HCS 2204 – Ecology of Managed Plant Systems, and HCS 2205 – Ecology of Managed Plant Systems Laboratory (HCS 2204 is planned to fulfill a Sustainability Theme GE). Would you please forward the attached concurrence forms and syllabi to any other interested units within your college? We would appreciate feedback by Friday, January 28, 2022.

Please let me know if you have any questions or need additional information.

Take care, and best wishes for a great holiday weekend!

Jeanne

THE OHIO STATE UNIVERSITY

Jeanne M. Osborne | *Pronouns: She, Her, Hers*
Assistant Dean for Academic Affairs
College of Food, Agricultural, and Environmental Sciences
100E Agricultural Administration, 2120 Fyffe Rd.
Columbus, OH 43210
Tel: 614-292-1734
Fax: 614-292-1218
e-mail: Osborne.2@osu.edu

'Unexpected kindness is the most powerful, least costly, and most underrated agent of human change' (Bob Kerrey)

Check out KINDNESS AT OHIO STATE at http://kind.osu.edu!

Subject: Re: HCS 2204 and 2205
Date: Tuesday, January 18, 2022 at 10:06:02 AM Eastern Standard Time
From: Brooks, Jeremy S.
To: Gardner, David, Sharp, Jeff
CC: Luikart, Meredith

That sounds great. Thank you both!

Best

Jeremy

From: "Gardner, David" <gardner.254@osu.edu>
Date: Tuesday, January 18, 2022 at 10:00 AM
To: "Brooks, Jeremy S." <brooks.719@osu.edu>, "Sharp, Jeff" <sharp.123@osu.edu>
Cc: "Luikart, Meredith" <luikart.6@osu.edu>
Subject: RE: HCS 2204 and 2205

Jeremy,

I thank you for your work on this. As far as the concurrence form, what I've been told is that the formality is necessary when asking a unit outside FAES abut within FAES an email is just fine – and I see Meredith just emailed you the same message.

Again, thank you again for your assistance.

Best Regards,

David Gardner
Prof. Turfgrass Science
240B Howlett Hall, 2001 Fyffe Ct.
Columbus, OH 43210
614-292-9002

From: Brooks, Jeremy S. <brooks.719@osu.edu>
Sent: Tuesday, January 18, 2022 9:58 AM
To: Gardner, David <gardner.254@osu.edu>; Sharp, Jeff <sharp.123@osu.edu>
Cc: Luikart, Meredith <luikart.6@osu.edu>
Subject: Re: HCS 2204 and 2205

Hi David and Meredith,

SENR has reviewed the syllabi for HCS 2204 and 2205 and are fully supportive of those courses. If you would like me to sign a concurrence form, can you please send one with the information filled in? I've attached the one that other units have used. If this email will suffice, that's OK as well. There doesn't seem to be a standard approach to obtaining concurrence within the College.

Best
Jeremy

From: Gardner, David <gardner.254@osu.edu>
Date: Friday, January 14, 2022 at 11:19 AM
To: Brooks, Jeremy S. <brooks.719@osu.edu>, Sharp, Jeff <sharp.123@osu.edu>
Cc: Luikart, Meredith <luikart.6@osu.edu>
Subject: FW: HCS 2204 and 2205

Jeremy and Jeff,

We kindly seek concurrence from SENR for HCS 2204 and 2205. These courses will replace HCS 2201. HCS 2204 will be a GE Sustainability Theme course. HCS 2205 is a lab that either requires students to take HCS 2204 previous or concurrently.

If you could provide this by our deadline of January 28, 2022, it would be much appreciated.

Thank you and let me know if you have any questions.

David Gardner
Prof. Turfgrass Science
240B Howlett Hall, 2001 Fyffe Ct.
Columbus, OH 43210
614-292-9002

Ohio State Department Course Review Concurrence Form

The purpose of this form is to provide a simple system of obtaining departmental reactions to proposed new courses, group studies, study tours, workshop requests, and course changes. A letter may be substituted for this form.

Academic units initiating a request which requires such a reaction should complete Section A of this form and send a copy of the form, course request, and syllabus to each of the academic units that might have related interests in the course. Initiating units should allow at least two weeks for responses.

Academic units receiving this form should response to Section B and return the form to the initiating unit. Overlap of course content and other problems should be resolved by the academic units before forwarding this form and all other accompanying documentation to the Office of Academic Affairs.

A. Information from academic unit *initiating* the request:

Initiating Academic Unit: Horticulture and Crop Science Date: 1/13/21

Registrar's Listing:

Course Number: HCS 2204 Level: U ☒ P ☐ G ☐ Credit Hours: 3

Course Title: Ecology of Managed Plant Systems

Type of Request: ☒ New Course ☐ Group Studies ☐ Workshop ☐ Study Tour ☐ Course Change

Academic Unit with related interests asked to review the request (use a separate form for each unit while requesting concurrences from multiple units): EEOB

Date responses are needed: 1/28/22

B. Information from academic units *reviewing* the request:

☑ The academic unit ***supports*** the proposal
☐ The academic unit ***does not support*** the proposal.
Please explain:

☐ The academic unit suggests:

Jan 26, 2022

Signature of Department Chair Signature of Graduate Studies Chair (if applicable)

Ian Hamilton, Vice Chair of Undergraduate Studies, EEOB

Subject: FW: Concurrence Request for HCS 2204/2205
Date: Tuesday, January 25, 2022 at 9:28:00 AM Eastern Standard Time
From: Osborne, Jeanne
To: Luikart, Meredith
CC: Barker, David
Attachments: image001.png

Meredith,

Another response.

Take care,

Jeanne

From: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>
Sent: Tuesday, January 25, 2022 8:17 AM
To: Osborne, Jeanne <osborne.2@osu.edu>
Subject: FW: Concurrence Request for HCS 2204/2205

Hello Jean –
Below is the response from FABE re 2204/2205.

So COE is covered.
Thanks,
Rosie

From: Winston, Ryan J. <winston.201@osu.edu>
Sent: Monday, January 24, 2022 3:03 PM
To: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>; May, Andy <may.561@osu.edu>
Subject: Re: Concurrence Request for HCS 2204/2205

Rosie,

In speaking with colleagues in FABE, we do not feel there is a need for us to provide concurrence for these courses. We are happy that the courses are proposed and see an overlap with some of our research.

Thank you,

Ryan

Ryan Winston, PhD, PE
Assistant Professor
Department of Food, Agricultural, and Biological Engineering
Department of Civil, Environmental, and Geodetic Engineering
Core Faculty, Sustainability Institute
Ohio State University

winston.201@osu.edu
(614) 292-9354

Associate Editor
Journal of Sustainable Water in the Built Environment
http://ascelibrary.org/journal/jswbay

From: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>
Sent: Friday, January 21, 2022 11:05 AM
To: May, Andy <may.561@osu.edu>; Winston, Ryan J. <winston.201@osu.edu>
Subject: FW: Concurrence Request for HCS 2204/2205

Hello Andy and Ryan –

Do you see any reason for your areas to require concurrence for this course?

Thanks!
Rosie

From: Osborne, Jeanne <osborne.2@osu.edu>
Sent: Thursday, January 13, 2022 4:05 PM
To: Quinzon-Bonello, Rosario <quinzon-bonello.1@osu.edu>
Cc: Luikart, Meredith <luikart.6@osu.edu>; Barker, David <barker.169@osu.edu>; Gardner, David <gardner.254@osu.edu>
Subject: Concurrence Request for HCS 2204/2205

Dear Rosie,

Good evening!

Attached please find the syllabi and concurrence requests from the Department of Horticulture and Crop Science in CFAES for a pair of new courses, HCS 2204 – Ecology of Managed Plant Systems, and HCS 2205 – Ecology of Managed Plant Systems Laboratory (HCS 2204 is planned to fulfill a Sustainability Theme GE). Would you please forward the attached concurrence forms and syllabi to any other interested units within your college? We would appreciate feedback by Friday, January 28, 2022.

Please let me know if you have any questions or need additional information.

Take care, and best wishes for a great holiday weekend!

Jeanne

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Jeanne M. Osborne | *Pronouns: She, Her, Hers*

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