HCS 4998 Undergraduate Research

Term: Spring 2021

Meeting Dates and Location: An individual’s weekly research schedule is determined by the student’s availability and should be discussed with the research mentor at the start of the semester. Meetings with the research mentor are by appointment.

Course Format

Independent Study - Hybrid (5%-50% online as appropriate for research project)

Instructor: Variable

   Name: HCS Faculty advisor
   Office, Laboratory, Greenhouse, Field, and Zoom locations

Credit Hours: 1 - 5 credits, course is repeatable 4 times up to a maximum of 12 credit hours.

Prerequisites: None

Course Description

Undergraduate research in Horticulture and Crop Science may take place in a laboratory, greenhouse, and/or field setting at The Ohio State University in Columbus, Wooster, and/or outlying branch farms. HCS 4998 should not be taken for Research with Distinction. A total of six credit hours from any combination of research or independent study courses (HCS 4998(H), HCS 4999(H), or HCS 4193) can count towards the Sustainable Plant Systems majors’ elective requirements.

Goals

1. Demonstrate scientific research competency in horticultural and/or agronomic science topics
2. Use appropriate forms of communication effectively at a professional level
3. Manage projects and time effectively

Learning Outcomes

By the end of the semester, students will gain experience/expertise in the following areas:

1. Understand and apply the scientific method
2. Develop original, sound scientific experiments
3. Critique scientific information
4. Learn and perform appropriate research techniques
5. Collect and analyze scientific data
6. Integrate and apply knowledge from various sources
7. Present experimental results in written or oral form to a diverse audience (such as a written research summary, report, or manuscript or presentation of research to a scientific audience at lab meeting or a scientific conference)
Course technology

For help with your password, university e-mail, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at [OCIO Help Hours](http://ocio.osu.edu/helphours), and support for urgent issues is available 24x7.

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

**Baseline technical skills for hybrid courses**

- Advanced computer and web-browsing skills
- Scheduling Zoom meetings, and basic screen sharing/white board use, and break-out room use.
- Proficiency in use of Buckeybox and/or accepted cloud storage resources for data sharing and editing.

**Technology skills necessary for this specific course**

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

**Required equipment and software**

- **Computer**: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection.
- **Webcam**: built-in or external webcam, fully installed and tested.
- **Microphone**: built-in laptop or tablet mic or external microphone.
- **Analytic and data visualization software** as appropriate for research project.

**Evaluation**

The course is designated S/U. A satisfactory (S) grade shall be determined as satisfactory progress towards 75% of semester-specific tasks, as agreed on by the faculty adviser and student (including verbal discussion and completion of the attached written agreement), at the beginning of each semester.

**How your grade is calculated**

Before engaging in the individual study, the student and instructor will meet to discuss the proposed research and timeline, appropriate number of credit hours, desired goals and outcomes, and the means of evaluation and assessment. The attached “Undergraduate Research Agreement” will be filled out to provide the student and faculty mentor with clear guidance regarding expectations, including attendance, timeline, deadlines, and tangible outcomes. Both the student and instructor should sign and keep a copy of the document for their own records. At the end of the semester, the student will prepare a summary of their research project goals, methods, and results, which will be turned in to the advisor no later than the end of finals week, which will inform whether the agreed upon research goals were satisfactorily met.

**Course Topics**

Through this course, students will develop skills in:
• Reading and interpreting scientific literature
• Experimental design
• Field and/or laboratory experimental techniques
• Data collection, analysis, and interpretation
• Scientific writing (Maintaining a complete research lab notebook and preparing a research project summary, research poster, and/or oral presentation)
• Professional communication (verbal and/or written)

COURSE POLICIES

Faculty feedback and response time

• Feedback: For large writing projects, you can generally expect feedback within 7 days.
• In person feedback: Group or one-on-one meetings will generally be held on at least a bi-weekly basis and provide the opportunity for progress updates and immediate feedback.
• E-mail: The instructor will reply to e-mails within 24 hours on instruction days as defined by the academic calendar [https://registrar.osu.edu/staff/bigcal.asp].

Attendance Policy

Expectations of number of hours a week spent on research activities will vary depending on the number of credit hours that the student is enrolled, but as a general guideline, 1 credit hour= 3 research hours.

Scheduled meetings and other live sessions

All scheduled events for the course, including lab meetings and agreed upon research symposia or conferences, are required. If you need to discuss an assignment, experiment, analysis, or research paper, please contact the faculty mentor directly to schedule time to meet. Please let them know in advance of any extenuating circumstances that might require a meeting to be rescheduled.

Discussion and communication guidelines

Respectful, thoughtful, professional communication is expected. Some suggested guidelines:

Writing style

Write using appropriate grammar, spelling, and punctuation for a professional setting.

Tone and civility

Strive to maintain a supportive learning community where everyone feels safe and where people can disagree amicably.

Citing your sources

During academic discussions, whether written or verbal, please cite your sources to support your argument. List at least the first author (et al.), year published, article title, journal, and page numbers. For online sources, include a link.

Backing up your work

Consider saving a digital copy of your research notes, data, and observations, to back up your work. Regular back-up of research data using Buckeybox or other accepted cloud storage is expected.

E-Mail Etiquette
Professional relationships should be maintained when using e-mail for this class. Below are guidelines from Bloomsbury’s guide on email etiquette that should be followed. Electronic communication that is considered inappropriate may not receive a response. Professionally appropriate e-mail will receive a response in a timely manner, though an immediate reply should not be expected. If you require an immediate response, consider using an in-person scheduled meeting.

**DO**

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

**DON’T**

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

**Written projects**

Your written work should be your own original work. In formal projects, you should follow [MLA/APA] style to cite the ideas and words of your research resources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in—but no one else should revise or rewrite your work.

**Reusing past work**

In general, you are prohibited in University courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you have explored in previous courses, please discuss the situation with me.

**Falsifying research or results**

All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to falsify results to make your project look more successful than it was.

**Collaboration and informal peer-review**

The course may include opportunities for formal collaboration with your lab mates. While collaboration and peer-review of research projects is encouraged, remember that you are expected to
perform your own work related to your research project unless otherwise agreed upon. If you are unsure about a particular situation, please feel free to ask ahead of time.

UNIVERSITY POLICIES see: https://ugeducation.osu.edu/faculty-and-staff-resources for current versions

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct at Student Life http://studentconduct.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 I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

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

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

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

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.
**Intellectual Property** (covered by copyright) includes Course materials (Text, Audio, Video, Multimedia, Sims, Apps, etc.), and Student Generated materials

**Disability Services**

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. 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.

**Requesting accommodations**

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to [Office of Student Life - Disability Services](https://office.ofstudentlife.osu.edu/disability-services) for more information.

**Accessibility of course technology**

This hybrid course may require use of learning management systems, cloud storage, video conference software and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Zoom access [https://resourcecenter.odee.osu.edu/carmenzoom/accessibility-carmenzoom]
- Streaming audio and video
- Synchronous course tools
- Definition OSU
- **Overview of Accessibility at OSU**
- If you require specific software for the course list or provide a link to the software’s accessibility privacy statements
  - Adobe Connect (Carmen Connect) Accessibility [Adobe Privacy Policy](https://www.adobe.com/privacy/)
  - MediaSite Accessibility Statement
  - Microsoft Office Accessibility [Microsoft Office 365 Privacy](https://www.microsoft.com/privacyoffice)
  - Proctorio Accessibility [Proctorio Privacy](https://www.proctorio.com/privacy)
  - Top Hat Accessibility [Top Hat Privacy](https://www.tophat.com/privacy)

**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.

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

UNIVERSITY RESOURCES - see: https://ugeducation.osu.edu/faculty-and-staff-resources for current versions

Counseling and Consultation Services

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student’s ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (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.
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.

Lyft Ride Smart at Ohio State

Lyft Ride Smart at Ohio State offers eligible students discounted rides, inside the university-designated service area, from 9 p.m. to 3 a.m. Each month, 10,000 discounted rides will be made available on a first-come, first-served basis with the average cost expected to be $1 to $2. Once the monthly allotment of 10,000 discounted rides is exhausted, Lyft’s normal service rates will apply for the remainder of the month. Prices may be impacted by distance, traffic, time of day, special events and prime time surcharges. To qualify for program discounts, users will need to schedule an “Economy” Lyft ride in personal mode (This change is temporarily in place as the coronavirus situation evolves).

Already have a Lyft account? Go to your account profile and link it to your Ohio State student email to qualify for discounted rides. Go to https://ttm.osu.edu/ride-smart for up-to-date information.

Off Campus Field Experiences:

Off-Campus Field Experiences may be necessary for completion of thesis research in certain cases. If applicable, guidelines and assessment of Field work, Internships, Visits for course projects/assessments will be determined and agreed upon by the student and instructor (see “How your grade is calculated”).
Undergraduate Research Agreement
Created by the Office of Undergraduate Research & Creative Inquiry and adapted by the Department of Horticulture and Crop Science

An undergraduate research agreement is a mechanism that helps the undergraduate researcher and the faculty mentor discuss expectations and build a productive and satisfying working relationship. Each agreement may be different—specific to the interests, projects, methodologies, and goals of each research experience. Please amend the agreement outline below as necessary. We recommend that the agreement be completed by the student and their faculty mentor prior to starting their HCS 4998 research experience.

General information

Student name:

Faculty mentor name:

Research schedule:

The student will dedicate a total of ______ hours per week towards their research project.

Scheduled time in the lab, greenhouse, field, etc.  Days:            Hours:

Who will directly supervise the student on this research, if not the faculty mentor?

What is the best way for the student to get their questions answered? (Who should they ask first? What is the best way to contact the faculty mentor with questions?)

How often, and in what form, will the student report their research progress and results to the faculty mentor? (Ex. Will the student attend lab meetings, submit progress reports, or meet on a regular basis with the faculty research mentor/direct supervisor?)
Research Project goals, outcomes, and assessments

1. What is the research question, general topic, and/or goal(s) of this project?

2. What methodology, skills, or techniques will the student learn and use?

3. Identify several anticipated outcomes (skills, knowledge, professional development, etc.) the student will gain during this research experience.

4. Identify any products (written research summary (as specified in the syllabus), journal article summaries, research posters, or presentations) that the student is expected to complete by the end of the research period.

5. How will the student’s research progress and success be evaluated?

Student Signature: ________________________________ Date: ________________

Research Mentor Signature: ________________________________ Date: ________________
## Timeline

(Suggested: Make a timeline outlining planned tasks, checkpoints, meetings, product due dates, etc. for future faculty/student conversations)

<table>
<thead>
<tr>
<th>Week</th>
<th>Planned tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>