

Term Information

Effective Term Spring 2023

General Information

Course Bulletin Listing/Subject Area Food, Agricul & Bio Engineer
Fiscal Unit/Academic Org Food, Agric & Biological Eng - D1123
College/Academic Group Engineering
Level/Career Undergraduate
Course Number/Catalog 3211
Course Title Introduction to Humanitarian Engineering Laboratory
Transcript Abbreviation Intro Humanit EngL
Course Description This course will introduce students to the field of Humanitarian and Development Innovation through experience-based learning. Weekly experiential activities will build context for engineering design and technologies to enhance sustainability in low resource settings as development workers. The overarching goal is to understand limits to human existence that inform humanitarian engineering design.
Semester Credit Hours/Units Fixed: 1

Offering Information

Length Of Course 14 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 Laboratory
Grade Roster Component Laboratory
Credit Available by Exam No
Admission Condition Course No
Off Campus Never
Campus of Offering Columbus, Lima, Mansfield, Marion, Newark, Wooster

Prerequisites and Exclusions

Prerequisites/Corequisites 3210 must be taken concurrently or as a prerequisite.
Exclusions
Electronically Enforced No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code 14.0301
Subsidy Level Baccalaureate Course
Intended Rank Junior

Requirement/Elective Designation

Sustainability

Course Details

Course goals or learning objectives/outcomes

- list several physical limits to human life (water, food, shelter, temperature, social interaction)
- identify potential benefits and costs to quality of life when shown a suggested engineering development project
- identify their emotional responses to potentially difficult topics
- appreciate economic decisions that need to be made by disenfranchised groups
- understand some of the lifestyle contexts of international engineering challenges
- understand how community participation and local knowledge benefit engineering design
- create a plan to approach community-based engineering projects
- apply fundamental engineering principles to calculate energy inputs for basic needs
- analyze when engineering solutions are appropriate

Content Topic List

- How water limitations, water treatment, hygiene and sanitation and agricultural land planning are impacted and impact economic decisions made by disenfranchised groups regarding technologies and development. Community-engaged engineering design.

Sought Concurrence

No

Attachments

- FABE 3210plus3211_interdisciplinary-team-taught-inventory_3_25_22.pdf
(Other Supporting Documentation. Owner: Conroy, Kristen)
- FABE 3211 GE Sustainability submission form_12_1_21.pdf
(Other Supporting Documentation. Owner: Conroy, Kristen)
- FABE 3211 Syllabus SP23_GE_Sustainability_6_7_22.docx: Syllabus
(Syllabus. Owner: Conroy, Kristen)
- FABE 3210_3211 cover letter intergrative interdisciplinary_7_13_22.docx: Cover Letter- Interdisciplinary
(Cover Letter. Owner: Conroy, Kristen)
- FABE 3210_3211_Sustainability GE Themes_Cover Letter_7_16_22.docx: Cover letter- Sustainability Theme
(Cover Letter. Owner: Conroy, Kristen)

Comments

- Adjust as per email feedback on 15 July 2022
- Revise as per COAA via email message sent 7 March 2022 *(by Osborne, Jeanne Marie on 07/15/2022 10:28 AM)*
- Please see Panel feedback email sent 05/17/2022. *(by Hilty, Michael on 05/17/2022 04:40 PM)*
- Please see my comments for FABE 3210. *(by Chen, Qian on 03/25/2022 02:37 PM)*
- per emails titled "RE: Intro to Humanitarian Engineering - Request from Instructor" ending 1/24/22 resolved no need for title change for 3210 and 3211 *(by Conroy, Kristen on 02/08/2022 10:22 AM)*

COURSE REQUEST
3211 - Status: PENDING

Last Updated: Osborne, Jeanne Marie
07/20/2022

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Conroy, Kristen	12/20/2021 04:44 PM	Submitted for Approval
Approved	Chen, Qian	12/21/2021 08:20 PM	Unit Approval
Revision Requested	Quinzon-Bonello, Rosario	01/04/2022 10:37 AM	Ad-Hoc Approval
Submitted	Conroy, Kristen	01/04/2022 11:39 AM	Submitted for Approval
Approved	Chen, Qian	01/04/2022 11:30 PM	Unit Approval
Revision Requested	Quinzon-Bonello, Rosario	01/21/2022 08:23 AM	Ad-Hoc Approval
Submitted	Conroy, Kristen	02/08/2022 10:23 AM	Submitted for Approval
Approved	Chen, Qian	02/09/2022 10:12 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	02/23/2022 04:57 PM	Ad-Hoc Approval
Revision Requested	Osborne, Jeanne Marie	03/07/2022 02:13 PM	College Approval
Submitted	Conroy, Kristen	03/25/2022 08:18 AM	Submitted for Approval
Revision Requested	Chen, Qian	03/25/2022 02:37 PM	Unit Approval
Submitted	Conroy, Kristen	03/28/2022 08:26 AM	Submitted for Approval
Approved	Chen, Qian	04/01/2022 10:37 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	04/01/2022 10:39 AM	Ad-Hoc Approval
Approved	Osborne, Jeanne Marie	04/01/2022 01:10 PM	College Approval
Revision Requested	Hilty, Michael	05/17/2022 04:40 PM	ASCCAO Approval
Submitted	Conroy, Kristen	07/14/2022 11:53 AM	Submitted for Approval
Approved	Chen, Qian	07/14/2022 12:11 PM	Unit Approval
Approved	Quinzon-Bonello, Rosario	07/15/2022 09:25 AM	Ad-Hoc Approval
Revision Requested	Osborne, Jeanne Marie	07/15/2022 10:28 AM	College Approval
Submitted	Conroy, Kristen	07/18/2022 10:51 AM	Submitted for Approval
Approved	Chen, Qian	07/19/2022 02:23 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	07/19/2022 09:30 AM	Ad-Hoc Approval
Approved	Osborne, Jeanne Marie	07/20/2022 07:31 AM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	07/20/2022 07:31 AM	ASCCAO Approval

To Sustainability TAG,

This letter describes changes made in response to feedback on FABE 3210/3211 Introduction to Humanitarian Engineering, courses being finalized under the GE Sustainability Theme.

To address the feedback provided, a Bibliography section has been added to each of the Syllabi.

- For FABE 3210, the bibliography begins on Page 17. This has been broken into two sections. The Required Readings will be done by all students. The readings listed under Research Review Articles will be assigned to pairs of students, who will present a review of the articles to their classmates throughout the semester.
- For FABE 3211, the bibliography begins on Page 17.

I sought further clarification on the point of connectivity between the GE theme document and the syllabus and was informed by Maria Conroy via email:

“From the standpoint of the Sustainability TAG, we understand the relevance of the material but the lack of readings to show theme context is the challenges. I understand that different programs have different syllabus templates though we have had SNR syllabi that includes readings in the schedule and/or with the topics. The only reading noted in the form that I can see is for designing a handwashing station. Since this is to be a themed course, it is important to understand how and where the concept is presented to students throughout the course. Other readings are noted as being on Carmen but no further insight is provided. This is what the Sustainability TAG is looking for in order to see how the topics are linked to the concept.”

Therefore, I am hopeful the addition of the bibliography clarifies how Sustainability is being discussed at the appropriate level of depth throughout the courses.

Thank you,

Kristen Conroy

To whom it may concern,

This is a letter providing further detail on the FABE 3210/3211 Introduction to Humanitarian Engineering course currently being finalized for the Interdisciplinary Team-Taught course within the General Education Sustainability Theme. The course is taught by one instructor in the department of Civil, Environmental and Geodetic engineering (here simplified to Civil engineering) and an instructor from the department of Food, Agricultural and Biological Engineering (here simplified to biological engineering).

As brief context for how the disciplines differ:

- Civil engineering is dependent mainly on abiotic components and derives solutions through calculations.
- Biological engineering incorporates living organisms into solutions and relies more than civil engineering on empirical evidence and experimental results.

These aspects lead to and result in different approaches, knowledge bases and solutions between the two disciplines. At the same time, the two disciplines often work together when designing water and food systems.

The instructors will bring their individual disciplinary lenses to the classroom throughout the semester and the two disciplines will be compared and brought into dialogue in four main areas:

- Using low-tech and high-tech wastewater treatment as an example, the civil engineering and biological engineering components and approaches will be described individually. Students will then be shown how these components fit together.
- Students will learn about the agricultural systems engaged in by a majority of the world's rural peoples, including ties between these systems and urban markets/resources. The unique impacts of biological engineering solutions and civil engineering solutions will be discussed.
- Students will be placed in teams and given high level descriptions of several civil or biological/ecological engineering solutions to a stormwater management design. After each team selects a solution based on their given discipline, the teams will come together to determine which solution is most sustainable and/or form a combined solution to maximize sustainability.
- Students will write a reflection based on content from the article *Toward bio-based geo and civil engineering solutions for a sustainable society* (Jonkers, 2017)

These components have been reflected in the syllabus where necessary. As the first three are in-class activities aligned with weekly topics, they are not explicitly stated in the syllabus beyond the topic heading. A Bibliography section has been added to the syllabus, including the Jonkers, 2017 article, which is part of the Reflection assignment series. Hopefully this answers the question regarding the interdisciplinary team-taught course content for FABE 3210/3211.

Thank you,

Kristen Conroy

Introduction to Humanitarian Engineering Laboratory Syllabus

FABE 3211 Spring 2023

Course Information

- **Course times and location:** Thursdays 12:10 p.m.-2:55 p.m.; location: TBD
- **Credit hours:** 1
- **Mode of delivery:** In-Person

Instructor

Department of Food, Agricultural and Biological Engineering:

Name: Kristen Conroy

Email: conroy.137@osu.edu

Phone: 614-292-6131

Office location: Room 250 Agricultural Engineering Building, 590 Woody Hayes Drive

Office hours: Appointment by email (conroy.137@osu.edu)

Preferred means of communication:

My preferred method of communication for questions is **email**.

My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Department of Civil, Environmental and Geodetic Engineering:

Name: Patrick Sours

Email: sours.17@osu.edu

Phone: 614-292-6131

Office location: Room 250 Agricultural Engineering Building, 590 Woody Hayes Drive

Office hours: Appointment by email (sours.17@osu.edu)

Preferred means of communication:

My preferred method of communication for questions is **email**.

My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your [notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to be sure you receive these messages.



Course Prerequisites

FABE 3210 (3 credit hours) must be taken concurrently or as a prerequisite.

Course Description

This course will introduce students to the field of Humanitarian and Development Innovation through experience-based learning. Weekly experiential activities will build context for engineering design and technologies to enhance sustainability in low resource settings as development workers. The overarching goal is to understand limits to human existence that inform humanitarian engineering design.

Course Learning Outcomes

By the end of this course, students should successfully be able to:

- list several physical limits to human life (water, food, shelter, temperature, social interaction)
- identify potential benefits and costs to quality of life when shown a suggested engineering development project
- identify their emotional responses to potentially difficult topics
- appreciate economic decisions that need to be made by disenfranchised groups
- understand some of the lifestyle contexts of international engineering challenges
- understand how community participation and local knowledge benefit engineering design
- create a plan to approach community-based engineering projects
- apply fundamental engineering principles to calculate energy inputs for basic needs
- analyze when engineering solutions are appropriate

General Education Expected Learning Outcomes

This course fulfills the Specific Goals 1, 2 and 3 and Expected Learning Outcomes 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2 and 3.3 for the General Education Themes, Sustainability.

When this 1-credit FABE 3211 laboratory is taken in combination with the 3-credit FABE 3210 lecture, together these 4-credits (i.e., 1-credit laboratory + 3-credit lecture) fulfill ALL Goals (i.e., Goals 1, 2 and 3) and ALL Expected Learning Outcomes (i.e., ELOs 1.1, 1.2, 1.3, 2.1, 2.2, 3.1, 3.2 and 3.3) for the Themes, Sustainability GE category.

Important note: For this course to fulfill the General Education Sustainability Theme, it must be taken in conjunction with FABE 3210 (3 credit hours) as a combined 4-credit hour integrative interdisciplinary Team-taught General Education course. This course will not fulfill the General Education course if not taken in combination with FABE 3210, "Introduction to Humanitarian Engineering".



FABE 3211 FULFILLS

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

Expected Learning Outcome 1.1: Engage in critical and logical thinking about the topic or idea of sustainability.

Expected Learning Outcome 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.

Expected Learning Outcome 2.1: Identify, describe and synthesize approaches or experiences as they apply to sustainability.

Expected Learning Outcome 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.

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

Expected Learning Outcome 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.

Expected Learning Outcome 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 these learning outcomes through several activities.

Students engage in lecture and assignment content related to basic human water needs. Students then walk with an empty bucket and then a full bucket of water a prescribed distance to mimic gathering water from a water body source as is done by folks who do not live in areas with centralized water distribution systems.

Students design and build water filtration systems and measure their efficacy.

Students design an agricultural plan given rainfall, soil, caloric and market pricing information for a plot of land with a prescribed size to meet the nutritional and caloric needs of a family.

Students participate in small-scale, sustainable agriculture and write a reflective review of their experience.

Students watch a film related to small-scale agriculture and economic instability in a developing country and write a reflection on their emotional responses to the film.

Students learn about basics of wastewater treatment and ecological toilet design. Students read and watch videos on the topic and reflect on their own responses to different sanitation scenarios. The impacts of waste management, or lack thereof, by human's is discussed.

Students work through the planning of a humanitarian engineering project focused on drinking water quality in India. Students review literature on the community, review research done on the water quality, design a data gathering procedure, design a team and schedule for a pilot project and reflect on the appropriateness of the project and their emotional responses to the needs of the community.



How This Course Works

Mode of delivery: There are required in-person sessions each week Thursdays from 12:10-2:55p.m. The rest of your work is found in Carmen and can be completed around your own schedule during the week.

Credit hours and work expectations: This is a 1 credit-hour course. According to [Ohio State bylaws on instruction](https://go.osu.edu/credithours) (go.osu.edu/credithours), students should expect around 3 hours per week of time spent on direct instruction, laboratory activities, and assignments and 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, I have the following expectations for everyone's participation:

- **Lab sessions: required**
Attendance for all live, scheduled classes for the course is expected. Students will be expected to contribute to the learning process by completing activities and sharing ideas and insights relative to the issues being discussed. If you have a situation that might cause you to miss a class, discuss it with me *as soon as possible*. In the case of excused absences, students will have the opportunity to earn credit for missed in-class activities.

Course Materials, Fees and Technologies

Required Materials and/or Technologies

- All required reading materials will be made available via the CarmenCanvas site.

Recommended/Optional Materials and/or Technologies

- A notebook for keeping notes during the experiential lab activities

Fees and/or Additional Requirements

- If online courses are required due to COVID 19 some small materials may be needed and we will discuss this as needed.

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection.
- **Webcam:** built-in or external webcam, fully installed and tested
- **Microphone:** built-in laptop or tablet mic or external microphone
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

If you do not have access to the technology you need to succeed in this class, review options for [technology and internet access](https://go.osu.edu/student-tech-access) (go.osu.edu/student-tech-access).

Required Software

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

CarmenCanvas Access

You will need to use [BuckeyePass](https://buckeyepass.osu.edu) (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the [BuckeyePass - Adding a Device](https://go.osu.edu/add-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](https://go.osu.edu/install-duo) (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 none of these options will meet the needs of your situation, you can contact the IT Service Desk at [614-688-4357 \(HELP\)](tel:614-688-4357) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- [Navigating CarmenCanvas](https://go.osu.edu/canvasstudent) (go.osu.edu/canvasstudent)
- [CarmenZoom virtual meetings](https://go.osu.edu/zoom-meetings) (go.osu.edu/zoom-meetings)
- [Recording a slide presentation with audio narration and recording, editing and uploading video](https://go.osu.edu/video-assignment-guide) (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 \(HELP\)](tel:614-688-4357)
- **Email:** servicedesk@osu.edu

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Percentage (%)
Individual Assignments: Pre-lab: 25% Post-lab: 25%	50
In-class Activities and Participation	40
Team Assignments	10
Total	100

See [Course Schedule](#) on Carmen for due dates.

Descriptions of Major Course Assignments

Individual Assignments:

Pre-lab assignments will be due at 11:59PM the day before the next lab meeting after it is assigned. These assignments will set context for the activity and ensure students are aptly prepared for the activities to be completed during the laboratory period. Pre-labs will consist of readings, videos, and exercises students are to watch, read and perform to be prepared for the day's topic and activities. Written reflections on the readings or videos and completed exercises will be turned in prior to the start of class. Pre-lab assignments will count for 25% of the final grade.

Post-lab assignments will be do at 11:59pm the day before the next lab meeting after it is assigned. Post-labs may consist of writing up data collected in the lab period and reflection upon lab activities. These will follow a typical post-lab format for aspects relating to team work, design, construction or testing depending on the specific lab. Additionally, the post-lab will contain a reflection component where students will describe any insights and understanding that occurred as result of the lab work. The post-lab assignments are an important aspect of incorporating knowledge gained in the lab and reflecting on the activities done in a productive manner. Post-lab assignments will count for 25% of the final grade.

Academic integrity and collaboration for Individual Assignments: Your written individual assignments should be your own original work. In formal assignments, you should follow a consistent style to cite the ideas and words of your research sources. You are encouraged to

ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite your work.

In-class Activities and Participation:

Students will be expected to contribute to the learning process by actively participating in the labs and sharing ideas and insights relative. Based on the experiential nature of the curriculum, student attendance at each lab is mandatory. Participation will include work done during the lab period and submitted at the conclusion of class. In the case of excused absences, students will have the opportunity to earn credit for missed in-class activities. Class participation will count for 40% of the final grade.

More detailed descriptions of the In-class Activities can be found in the Experiences Descriptions section of this document.

Team Assignments:

Student teams will prepare and present a Final Presentation on their research, brainstorming, remaining questions and where information could be sought with regards to their assigned engineering design problem. The Final Presentation given by each team at the end of the semester will account for 10% of the total grade.

Late Assignments

Late assignments will not be accepted after the due date except in the case of an approved extension that has been arranged with the instructor prior to the due date (for example, as a result of an excused absence); or in the case of illness/emergency, contact the instructor as soon as possible. Extensions will be determined on a case-by-case basis with official documentation.

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call [614-688-4357 \(HELP\)](tel:614-688-4357) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**. Please allow until the next business day on weekends and holidays.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](http://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Grading and feedback:** For assignments submitted before the due date, I will try to provide feedback and grades within **seven days**.

Grading Scale

93–100: A

90–92.9: A-

87–89.9: B+

83–86.9: B

80–82.9: B-

77–79.9: C+

73–76.9: C

70–72.9: C-

67–69.9: D+

60–66.9: D

Below 60: E



Other Course Policies

Discussion and Communication Guidelines

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

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online. 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.

Academic Integrity Policy

See [Descriptions of Major Course Assignments](#) for specific guidelines about collaboration and academic integrity in the context of this online class.

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](#) (studentconduct.osu.edu), 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:

- [Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)
- [Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)
- [Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

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."

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

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

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. 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.

Disability Services Contact Information

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

Accessibility of Course Technology

This 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](http://go.osu.edu/canvas-accessibility) (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- [CarmenZoom accessibility](http://go.osu.edu/zoom-accessibility) (go.osu.edu/zoom-accessibility)

Course Schedule

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

Week	Laboratory Experiences	Assignments Due
Week 1	- Introduction: What is Humanitarian and Development Innovation and how does engineering fit in?	
Week 2	- Gathering our water	Pre-lab
Week 3	- Treating our water	Pre-lab Post-lab
Week 4	- Purchasing our land - Building our home	Pre-lab
Week 5	- Selecting our toilet	Pre-lab Post-lab
Week 6	- Handwashing stations	Pre-lab
Week 7	- Market place decisions at home and abroad - Limits to human life	Pre-lab
Week 8	- Soccer ball designs	Post-lab
Week 9	- Growing our food P1	Pre-lab Post-lab
Week 10	- Growing our food P2	Pre-lab Post-lab
Week 11	- Making our food - Activity Wheel	Pre-lab Post-lab
Week 12	No lab period	
Week 13	Design Challenge: TBD (Research)	Post-lab
Week 14	Design Challenge: TBD (Design Concepts)	
Week 15	- Design Presentations	Final Presentation

Laboratory Experience Descriptions:

Gathering our water:

Students will be assigned an amount of water and distance that they need to transport said water. Each student will need to transport the given amount from the starting point to the destination. Students will then determine how long this process took and what power they developed during this process.

Students will then either be assigned an existing filter system or be asked to develop a filter system based on a handful of available materials. Those using existing filters will critique the technology and those designing filters will provide a list of questions developed through the design process.

Treating our water:

Students will be introduced to various concepts of physical, biological and chemical water treatment. Each group will be assigned a treatment method. Based on their first-hand experience, students will note the constraints to the use of their design as a viable option for household scale drinking water treatment. Accommodations will be made for students requiring assistance to complete this assignment.

Purchasing our Land and Building our Home:

Students will be assigned the land purchase regulations of a given country. Based on this information, the students will determine how much money would be needed to purchase a farm large enough to feed themselves and their families, as well as to have surplus for the market. Student teams will attempt to purchase land and will come up against challenges in the process. Students will then be required to produce a general home design based on local materials and accounting for local climate conditions (heat transfer)

Market place decisions:

Students will each be assigned a budget that represents their spending power for the week. Students will then need to purchase the necessary materials to support their family for the coming week by strategizing and budgeting at the market. Developing a strategy to maximize purchasing power will be required.

Toilets:

Examples of both successful and unsuccessful sanitation interventions will be discussed. Based on daily averages data, water requirements for improved sanitation systems will be calculated. Waste recycling and various potential applications will be discussed. Students will calculate the potential impacts of waste recycling on soil nutrients.

Handwashing Stations:

Students will work together as a class to construct and test a handwashing station. From the design, students will calculate the flow rate of the water and frequency of filling required for a small school. The history, production and science of soap will also be discussed.

Soccer ball Designs:

Given a limited supply of materials and a list of end-user needs, student teams will brainstorm ideas for soccer ball construction. Students will then use a decision matrix to select the best design to move forward. Each team will construct their soccer ball and then the class will test the soccer balls in relation to one of the design criteria.

Growing our Food (P1):

Students will be responsible for preparing their farm plot for planting. This will include planning the plot by considering necessary spacing, depth, harvesting processes, etc. Once a design

has been organized with these considerations, students will dig the necessary furrows and plant their seeds.

Growing our Food (P2):

Each student team will be assigned a random weather pattern to apply to their crops including: rainfall, cloud/sunny days, and daily temperatures. Based on the resultant yield, students will determine how long the crop would last given their assigned family/community size and preservation possibilities.

Making our Food:

Students will take their “harvest” and use this to produce a traditional starch-based food. Collection and processing will be done to prepare the necessary flour/dough for cooking. Students will use calorimetry to determine how much food energy is available from their food product and how this relates the typical calorie needs and intake for the population. Students will then relate these to activity wheels representing typical amount of time put into agricultural work for a community and compare output to input.

Design Challenge:

A design challenge relevant to a current community OSU Engineering engages with will be presented to a small student group. Students will spend one week researching the topic and gaining knowledge around the relevant engineering principles, existing designs and technical aspects related to the design topic. Students will then spend a second week brainstorming designs. From here, students will identify areas where more knowledge/research is needed. The unknown information will then be categorized into areas by where the information could be garnered. This could include, but is not limited to, the persons/community who are end-users of the design, the local government of said community, the scientific literature or through application of engineering principles. Students will present on their research, brainstorming, remaining questions and where information could be sought.

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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.

Course subject & number

General Expectations of All Themes

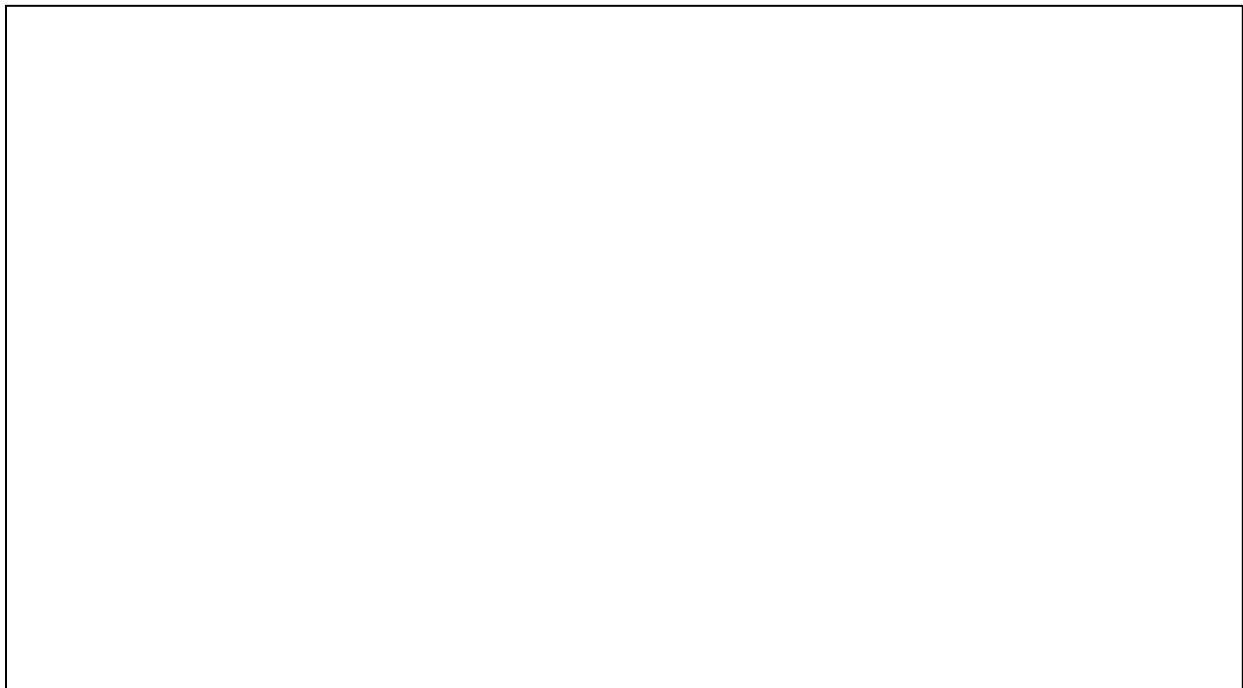
GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.

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)*

Course subject & number

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)

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)

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Course subject & number

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)

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)

Course subject & number

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)

Course subject & number

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)

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)

Interdisciplinary Team-Taught Course Inventory

Overview

The GE allows students to take a single, 4+ credit course to satisfy a particular GE Theme requirement if that course includes key practices that are recognized as integrative and high impact. Courses seeking one of these designations need to provide a completed Integrative Practices Inventory at the time of course submission. This will be evaluated with the rest of the course materials (syllabus, Theme Course submission document, etc). Approved Integrative Practices courses will need to participate in assessment both for their Theme category and for their integrative practice.

Please enter text in the boxes below to describe how your class will meet the expectations of Interdisciplinary Team-Taught courses. It may be helpful to consult the Description & Expectations document for this pedagogical practice or to consult your Director of Undergraduate Studies or appropriate support staff person as you complete this Inventory and submit your course.

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.

Accessibility

If you have a disability and have trouble accessing this document or need to receive it in another format, please reach out to Meg Daly at daly.66@osu.edu or call 614-247-8412.

Pedagogical Practices for Interdisciplinary Team-Taught Courses

Course subject & number

Performance expectations set at appropriately high levels (e.g. Students investigate large, complex problems from multiple disciplinary perspectives). Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Interdisciplinary Team-Taught Course Inventory

Significant investment of time and effort by students over an extended period of time (e.g., engage the issue iteratively, analyzing with various lenses and seeking to construct an integrative synthesis). Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Interactions with faculty and peers about substantive matters including regular, meaningful faculty mentoring and peer support about conducting interdisciplinary inquiry. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Interdisciplinary Team-Taught Course Inventory

Students will get frequent, timely, and constructive feedback on their work, scaffolding multiple disciplinary perspectives and integrative synthesis to build over time. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Periodic, structured opportunities to reflect and integrate learning (e. g. students should work to integrate their insights and construct a more comprehensive perspective on the issue). Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Interdisciplinary Team-Taught Course Inventory

Opportunities to discover relevance of learning through real-world applications and the integration of course content to contemporary global issues and contexts. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Public Demonstration of competence, such as a significant public communication of their integrative analysis of the issue. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

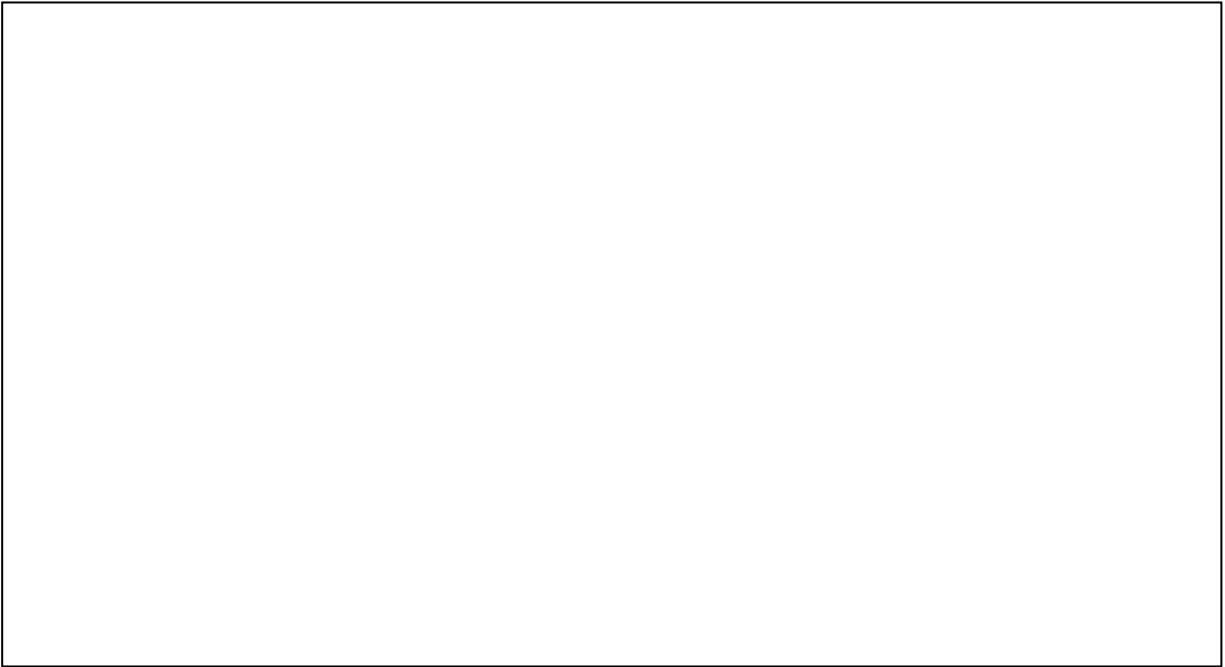
Interdisciplinary Team-Taught Course Inventory

Experiences with diversity wherein students demonstrate intercultural competence and empathy with people and worldview frameworks that may differ from their own. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Explicit and intentional efforts to promote inclusivity and a sense of belonging and safety for students, e.g. universal design principles, culturally responsive pedagogy, structured development of cultural self-awareness. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

Interdisciplinary Team-Taught Course Inventory

Clear plans to promote this course to a diverse student body and increase enrollment of typically underserved populations of students. Please link this expectation to the course goals, topics and activities and indicate *specific* activities/assignments through which it will be met. (50-500 words)

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