

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 3210
Course Title Introduction to Humanitarian Engineering
Transcript Abbreviation Intro Humanit Eng
Course Description This course will introduce students to the field of Humanitarian Engineering, cover a variety of potential career paths in this field, explore engineering equations as they apply to problem solving in low-resource settings, introduce students to reflection and communication skills for working as engineers in sustainable development and discuss cultural constraints for engineering problems.
Semester Credit Hours/Units Fixed: 3

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 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
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

- Identify multiple potential career paths within humanitarian engineering
- Describe a participatory approach to humanitarian engineering
- Apply engineering equations to low-resource design solutions
- Utilize self-reflection techniques for processing new experiences
- Describe a participatory approach to humanitarian engineering
- Analyze trends and impacts of cultural systems, natural resource availability and technology access globally on engineering design processes (particularly problem definition and identification of constraints)
- Critically review contemporary research and project literature in sustainable development engineering

Content Topic List

- Current research in Humanitarian Engineering and how to approach the literature
- Global trends in human/environment interaction
- Lifestyle variations and relevance to engineering design
- Global trends in natural resource distribution, technology availability, colonization and independence timelines
- Introduction to participatory community development for technology adoption
- Individual reflection and processing techniques for designing in the field
- Sanitation opportunities and tried solutions
- Challenges and design for engineering in participatory community development

Sought Concurrence

No

Attachments

- FABE 3210plus3211_interdisciplinary-team-taught-inventory_3_25_22.pdf
(Other Supporting Documentation. Owner: Conroy, Kristen)
- FABE 3210 GE Sustainability submission form_12_1_21.pdf
(Other Supporting Documentation. Owner: Conroy, Kristen)
- FABE 3210 Syllabus SP23_GE_Sustainability_7_13_22.docx
(Syllabus. Owner: Conroy, Kristen)
- FABE 3210_3211 cover letter integrative interdisciplinary_7_13_22.docx
(Cover Letter. Owner: Conroy, Kristen)
- FABE 3210_3211_Sustainability GE Themes_Cover Letter_7_16_22.docx
(Cover Letter. Owner: Conroy, Kristen)

Comments

- Adjust as per email feedback 15 July 2022
- Revise as per COAA via email message 7 March 2022 *(by Osborne, Jeanne Marie on 07/15/2022 10:27 AM)*
- Please see Panel feedback email sent 05/17/2022. *(by Hilly, Michael on 05/17/2022 04:40 PM)*
- Per Jeanne's email, the Sustainability Theme GE form is not attached. *(by Chen, Qian on 03/25/2022 02:36 PM)*

COURSE REQUEST
3210 - Status: PENDING

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

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Conroy, Kristen	12/20/2021 04:23 PM	Submitted for Approval
Approved	Chen, Qian	12/21/2021 08:19 PM	Unit Approval
Revision Requested	Quinzon-Bonello, Rosario	01/04/2022 10:37 AM	Ad-Hoc Approval
Submitted	Conroy, Kristen	01/04/2022 11:35 AM	Submitted for Approval
Approved	Chen, Qian	01/04/2022 11:28 PM	Unit Approval
Revision Requested	Quinzon-Bonello, Rosario	01/21/2022 08:23 AM	Ad-Hoc Approval
Submitted	Conroy, Kristen	02/08/2022 10:20 AM	Submitted for Approval
Approved	Chen, Qian	02/09/2022 10:10 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	02/23/2022 04:56 PM	Ad-Hoc Approval
Revision Requested	Osborne, Jeanne Marie	03/07/2022 02:13 PM	College Approval
Submitted	Conroy, Kristen	03/25/2022 08:16 AM	Submitted for Approval
Revision Requested	Chen, Qian	03/25/2022 02:36 PM	Unit Approval
Submitted	Conroy, Kristen	03/28/2022 08:25 AM	Submitted for Approval
Approved	Chen, Qian	04/01/2022 10:37 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	04/01/2022 10:38 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 11:56 AM	Submitted for Approval
Approved	Chen, Qian	07/14/2022 12:12 PM	Unit Approval
Approved	Quinzon-Bonello, Rosario	07/15/2022 09:25 AM	Ad-Hoc Approval
Revision Requested	Osborne, Jeanne Marie	07/15/2022 10:27 AM	College Approval
Submitted	Conroy, Kristen	07/18/2022 10:49 AM	Submitted for Approval
Approved	Chen, Qian	07/19/2022 02:22 AM	Unit Approval
Approved	Quinzon-Bonello, Rosario	07/19/2022 09:30 AM	Ad-Hoc Approval
Approved	Osborne, Jeanne Marie	07/20/2022 07:27 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 07:27 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 Syllabus

FABE 3210 Spring 2023

Course Information

- **Course times and location:** Tuesday and Thursdays, 9:35 a.m.-10:55 a.m.; location:TBD
- **Credit hours:** 3
- **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: 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

There are no prerequisites for this course.

Course Description

This course will introduce students to the field of Humanitarian Engineering, cover a variety of potential career paths in this field, explore engineering equations as they apply to problem solving in low-resource settings, introduce students to reflection and communication skills for working as engineers in sustainable development and discuss cultural constraints for engineering problems.

Learning Outcomes

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

- Identify multiple potential career paths within humanitarian engineering
- Describe a participatory approach to humanitarian engineering
- Apply engineering equations to low-resource design solutions
- Utilize self-reflection techniques for processing new experiences
- Describe a participatory approach to humanitarian engineering
- Analyze trends and impacts of cultural systems, natural resource availability and technology access globally on engineering design processes (particularly problem definition and identification of constraints)
- Critically review contemporary research and project literature in sustainable development engineering

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 3-credit FABE 3210 lecture is taken in combination with the 1-credit FABE 3211 laboratory, together these 4-credits (i.e., 3-credit lecture + 1-credit laboratory) 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: This course will fulfill 3 credit-hours towards the General Education Sustainability Theme when taken as a stand-alone course. If taken in conjunction with FABE 3211 (1 credit hour), this course will fulfill the General Education Sustainability Theme as a 4-credit hour Integrative Interdisciplinary Team-taught General Education course.

FABE 3210 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 complete an activity where they take an item used in daily life and must identify one element/natural resource used in the technology. Students must then identify where this resource is located and where it is consumed. Students research how the resource is extracted/mined/harvested and do calculations related to the energy and power needed for these processes. This allows students to draw connections between areas where extraction occurs and areas where consumption occurs and to understand the various methods of extraction and their requirements of human and/or fossil fuel energies. (Resources: Natural and Technical)

Students complete two activities where they review various photographic and video footage of people's day to day lives in a variety of locations around the globe. Students are asked to identify variations in human/environment interaction in these sources. Students reflect on the impacts of technology on lifestyle and human/environment interaction. (Day in the Life and Gapminder)

Students learn about colonization through activities identifying the year of independence for various countries and from which country they gained independence (Independence Timelines). Students listen and respond to lecture content and podcasts relaying the history of colonization in different parts of the world, including South America, Southeast Asia and the African continent and ongoing impacts. (Imperialism, Colonization and Decolonization)

Students write several reflection responses after 1) reviewing articles related to health impacts and failed attempts at altering cooking technologies, 2) innovations within refugee communities and 3) tracking their water use for several days and learning about ancient water collecting techniques. (Reflection Assignments 1-3)

Students write a statement about their perception of the value of acknowledging one's own perspective on a research topic, describe their own perspectives of engineering and explore their own knowledge of place after reading: Hess, Justin and Strobel, Johannes. 2013. Indigenous Ways of Doing: Synthesizing Scholarly Literature on Ethno-Engineering. *International Journal of Engineering, Social Justice and Peace*, 2 (2): 55-80. (Ethno-Engineering)

Students will prepare a technical paper and presentation focusing on one aspect of Humanitarian Engineering by exploring 5+ resources on the topic. Topics can range widely and may include natural resource distribution, technology transfer and capacity building or cutting-edge sustainable technologies. (Final Paper and Presentation)

Several times throughout the semester, students read a peer-reviewed journal article pertaining to humanitarian engineering and, with a partner, give a 10 minute review presentation of the article. Articles cover topics of technology design, impacts of technology on communities, frameworks for engaging communities in co-design. Topics covered include disaster relief shelters, improved garbage collectors, solar power, menstrual sanitation, wastewater treatment, drinking water treatment, communication devices, food preservation techniques and more. (Review of Research Articles)

How This Course Works

Mode of delivery: There are required classes Tuesday and Thursdays, 9:35 a.m.-10:55 a.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 3 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 (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example) to receive a grade of C average.

Attendance and participation requirements: 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:

- **Lectures: required**
Attendance for all live, scheduled classes for the course is expected. Students will be expected to contribute to the learning process by sharing ideas and insights relative to the issues being discussed. Participation will also include preparing questions for guest lecturers and in-class activities. 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 Texts

- All required reading materials will be made available via the CarmenCanvas site. A list of readings can be found in the bibliography section at the end of this document.

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 (Homework) Assignments	40
Team (Review of Research Article) Assignments	20
Class Participation	15
Final Paper and Presentation	25
Total	100

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

Descriptions of Major Course Assignments

Individual Homework Assignments:

Individual homework assignments will be composed of reflection activities and summaries associated with various readings, videos, research, etc. Students should dedicate ample time to reflections and summaries that include responses to the material presented. Further detail on individual assignments will be provided on the Carmen site for this course. These assignments will account for 40% of the final grade.

Reviews of Research Articles:

Several times throughout the semester, students will read assigned peer-reviewed research articles on topics related to Humanitarian Engineering and sustainable development. Students will then work with a partner(s) to present a review of the article. This will include a summary of the rationale, methods, results, and conclusions, as well as a critical review of the relevance and quality of the research. One assignment per team per paper reviewed. These assignments will account for 20% of the final grade. For a list of articles, please refer to the Bibliography at the end of this document.

Class Participation:

Students will be expected to contribute to the learning process by sharing ideas and insights relative to the issues being discussed. Participation will also include preparing questions for guest lecturers and in-class activities. In the case of excused absences, students will have the opportunity to earn credit for missed in-class activities. Class participation and attendance will

account for 15% of the final grade.

Final Paper and Presentation:

Students will prepare a technical paper and presentation focusing on one aspect of Humanitarian Engineering by exploring 5+ resources on the topic. Topics can range widely and may include natural resource distribution, technology transfer and capacity building or cutting-edge sustainable technologies. Rubric for the Final paper and presentation can be found on the Carmen site for this course. Final paper and presentation will account for 25% of the final 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 (conroy.137@osu.edu). Please do not email conroy.137@buckeyemail.osu.edu. I will do my best to reply to emails within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check [your notification preferences](https://go.osu.edu/canvas-notifications) (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Grading and feedback:** For assignments submitted by 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

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

- **Tone and civility:** Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. For course materials, list at least the first author, title and page numbers. For online sources, include the first author, title and 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. (A) indicates assignments.



Week	Topics and Assignments
1	How do engineering and sustainability fit in to humanitarian work?
2	Current research in Humanitarian Engineering and how to approach the literature <ul style="list-style-type: none"> Positionality Statements (A)
3	Global trends in human/environment interaction <ul style="list-style-type: none"> IDI assessment (A)
4	Lifestyle variations and relevance to engineering design <ul style="list-style-type: none"> Gapminder (A) Day in the life (A)
5	Global trends in natural resource distribution, technology availability, colonization and independence timelines <ul style="list-style-type: none"> Resources: Natural and Technical (A)
6	Introduction to participatory community development for technology
7	Case study: stormwater management <ul style="list-style-type: none"> Reflection Assignment #1 (A) Guest Lecture Reflection (A)
8	Individual reflection and processing techniques for designing in the field <ul style="list-style-type: none"> Knowledge/Attitude/Practice Assignment (A)
9	Career paths/guest speaker <ul style="list-style-type: none"> Guest Lecture Prep (A) Reflection Assignment #2 (A)
10	Case study: agricultural and food systems <ul style="list-style-type: none"> Guest Lecture Reflection (A)
11	Social impact companies <ul style="list-style-type: none"> Social-Impact Company Assignment (A)
12	Case study: wastewater and sanitation solutions



13	Challenges and design for engineering in participatory community development
14	Other professionals involved in Humanitarian Engineering/Development <ul style="list-style-type: none"> • Reflection Assignment #3 (A)
15	<ul style="list-style-type: none"> • Final Presentation and Report (A)

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Required Readings:

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Research Review Articles:

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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

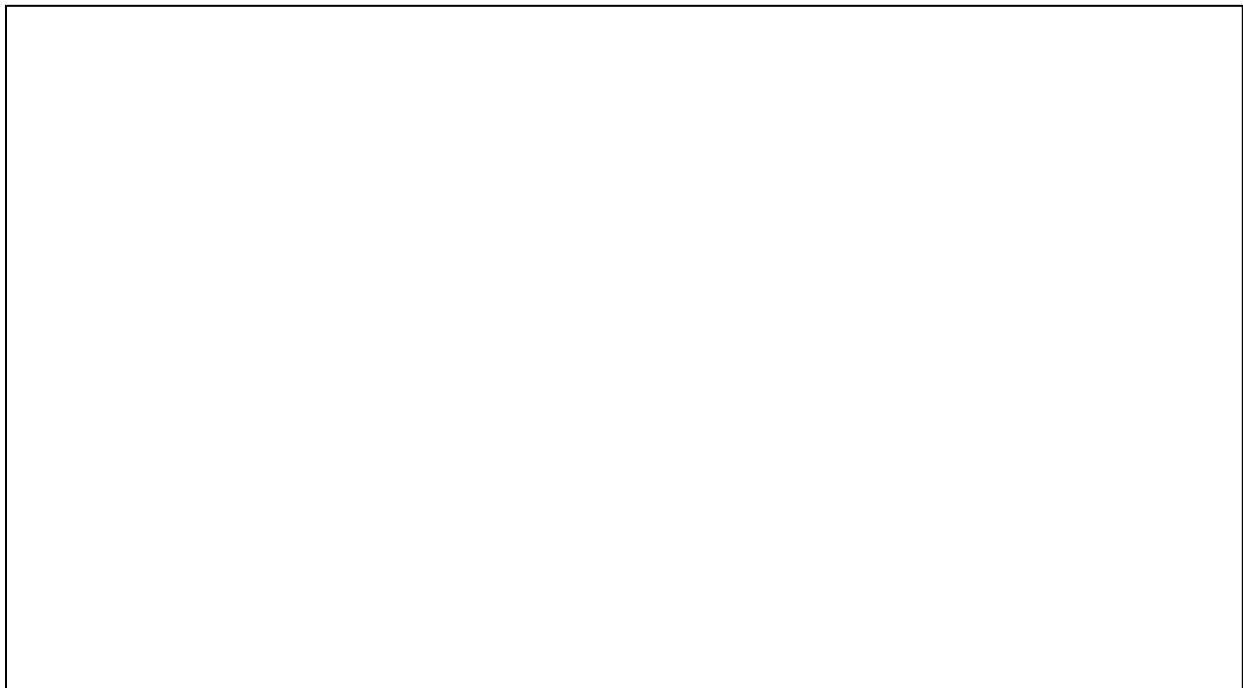
GOAL 1: Successful students will analyze an important topic or idea at a more advanced and in-depth level than the foundations.

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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