COURSE REQUEST 3211 - Status: PENDING

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 No

education component?

Grading Basis Letter Grade

Repeatable No

Course Components

Grade Roster Component

Credit Available by Exam

Admission Condition Course

No

No

No

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

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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. Communityengaged engineering design.

Sought Concurrence

No

Attachments

• FABE 3211 Syllabus SP23_GE_Sustainability_3_25_22.pdf: Syllabus

(Syllabus. Owner: Conroy, Kristen)

• FABE 3210plus3211_interdisciplinary-team-taught-inventory_3_25_22.pdf

(Other Supporting Documentation. Owner: Conroy, Kristen)

• FABE 3211 GE Sustainablity submission form_12_1_21.pdf

(Other Supporting Documentation. Owner: Conroy, Kristen)

Comments

- Please see my comments for FABE 3210. (by Chen, Qian on 03/25/2022 02:37 PM)
- Revise as per COAA via email message sent 7 March 2022 (by Osborne, Jeanne Marie on 03/07/2022 02:13 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

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
Pending Approval	Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadet te Chantal Steele,Rachel Lea	04/01/2022 01:10 PM	ASCCAO Approval

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 <u>notification preferences</u> (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 <u>notification preferences</u> (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

<u>GOAL 1:</u> Successful students will analyze sustainability at a more advanced and indepth level than in the Foundations component.

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

<u>Expected Learning Outcome 1.2</u>: Engage in an advanced, in-depth, scholarly exploration of the topic or idea of sustainability.

<u>GOAL 2:</u> 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.

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

<u>Expected Learning Outcome 2.2:</u> 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.

<u>GOAL 3:</u> 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.

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

<u>Expected Learning Outcome 3.2:</u> 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.

<u>Expected Learning Outcome 3.3:</u> 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 (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 (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 <u>installing Office 365</u> (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

You will need to use <u>BuckeyePass</u> (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 <u>BuckeyePass - Adding a Device</u> (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo
 login screen on your computer, click Enter a Passcode and then click the Text me new
 codes button that appears. This will text you ten passcodes, good for 365 days, that
 can each be used once.

 Install the Duo Mobile application (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

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

Technology Support

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

Self Service and Chat: go.osu.edu/it

Phone: 614-688-4357 (HELP)

Email: <u>servicedesk@osu.edu</u>

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 <u>614-688-4357 (HELP)</u> 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 <u>your notification preferences</u> (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 <u>Descriptions of Major Course Assignments</u> 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 (go.osu.edu/coam)
- <u>Ten Suggestions for Preserving Academic Integrity</u> (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (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 (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766. 24-hour emergency help is available through the National Suicide Prevention Lifeline website (suicidepreventionlifeline.org) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app (go.osu.edu/wellnessapp) is also a great resource.

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

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

• Website: slds.osu.edu

Email: slds@osu.edu

In person: <u>Baker Hall 098, 113 W. 12th Avenue</u>

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.

- <u>CarmenCanvas accessibility</u> (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- <u>CarmenZoom accessibility</u> (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
VVEEK 3	- Heating our water	Post-lab
Week 4	- Purchasing our land	Pre-lab
WOOK 4	- Building our home	110 100
Week 5	- Selecting our toilet	Pre-lab
		Post-lab
Week 6	- Handwashing stations	Pre-lab
Week 7 - Market place decisi		Pre-lab
	at home and abroad	
	- Limits to human life	
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	Pre-lab
	- Activity Wheel	Post-lab
Week 12	No lab period	
Week 13 Design Challenge: TBD		Post-lab
	(Research)	
Week 14 Design Challenge: Te		
	(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.

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 <u>as specific as possible</u>, 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)	

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

GOAL 2: Successful students will integrate approaches to the theme by making

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)

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 <i>specific</i> 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 <i>specific</i> activities/assignments through
which it will be met. (50-700 words)