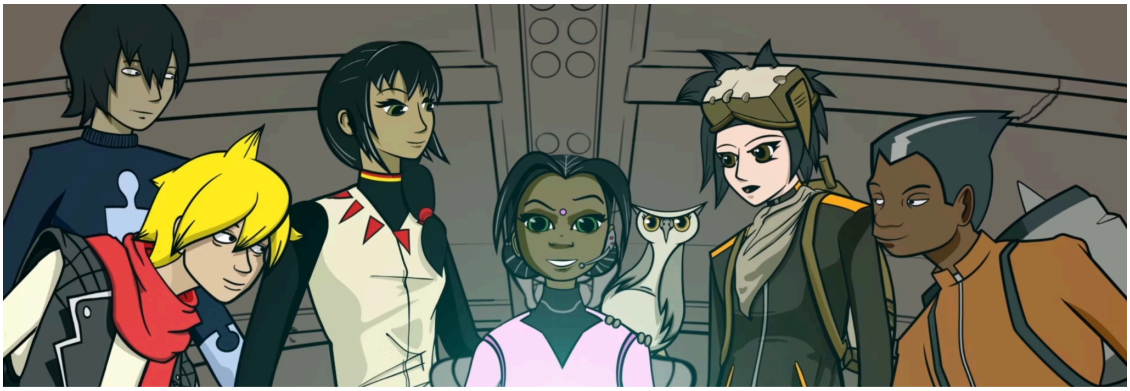

Expert Engineers

INSTRUCTOR INFORMATION

Please go to your course and access the 'Course Home' for detailed instructor information.

CONTACT INFORMATION

I am available by email. Please feel free to contact me if you have any questions regarding your assignments. Every effort will be made to reply to you immediately. I make a point to respond to emails within 24 hours on weekdays and 48 hours on weekends.

COURSE REQUIREMENTS

All learners must have a computer and internet access. Participants in online classes must be comfortable with the basic functions of word-processing software, including GOOGLE DOCS, Kami extension (to write on PDF), and Adobe Scan (to take pictures of printed work). Information about Kami and Adobe Scan can be found in the course orientation assignment.

This is an online course. In each unit, students will be expected to participate in discussions and proceed through the Weekly Agenda, which may include videos, PowerPoints, virtual labs, research, data gathering and analysis, assignments, or projects. Online simulations will be included in this exploration and may require tech support. Learners will be encouraged to show understanding in creative projects.

Course Goals

- Students will gain a foundational understanding of the engineering design process.
- Students will explore various engineering disciplines and their applications in real-world projects.
- Students will develop problem-solving skills through hands-on design challenges focused on electricity, magnetism, and alternative energy sources.
- Students will hone their communication skills through project presentations and reflections.
- Students will learn about the importance of planning, collaboration, and reflection in engineering design.

COURSE DESCRIPTION

In this course, learners will tackle real-world engineering challenges to experience the design process. They will also think like entrepreneurs and come up with a business plan for how their devices can be produced, sold, and used in the real world. We will be using videos and lessons from Global Problem Solvers: The Series and ScienceBuddies.org, modified for online use…as well as a nice dose from Mark Rober.

COURSE TOPICS

Unit 1. The Engineering Design Process
    Egg Drop Engineering
Unit 2. The Solar-Powered Classroom
Unit 3. Build a Machine to Lift Water

Unit 4. Using Technology to Solve a Local Problem

NGSS STANDARDS COVERED:

- **MS-ETS1-1**. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

- **MS-ETS1-2**. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

- **MS-ETS1-4**. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

- **3-5-ETS1-1**. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

- **3-5-ETS1-2**. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

- **3-5-ETS1-3**. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

METHODS OF INSTRUCTION

This is an asynchronous, online course, and while there is flexibility in how and when you do assignments, it is best to log in and complete work each day according to the posted pacing schedule. Each BLOCK in a course is worth about 1 week of work during the regular semester. You can find our suggested pacing guide at ileadonline.org under 'CALENDARS'. It is highly recommended that learners follow the pacing schedule posted. Please be sure to check in with your teacher of record (coach/EF/Guide/ES) for guidance with scheduling.

This course uses project-based learning to encourage an authentic, developed appreciation of the topics covered. That means that while it may include quizzes and some traditional assessments, the bulk of the coursework focuses on projects that require learners to display their learning in a thorough and creative manner. If you are struggling to complete your work or you need some assistance with an alternate schedule or workload, please contact me as soon as possible. I am more than happy to help support your success in the class!

LEARNER EXPECTATIONS

The learner is expected to participate in the course via e-mail, discussion boards (or other communication) with the facilitator, by reading the assigned readings, submitting assignments, and completing and submitting original work.

Learners are expected to check their course and email accounts every day and complete work on time as assigned with designated dates and times.

Learners are expected to communicate with their instructor and each other in a respectful manner. Please follow the guidelines below:

1. **Make sure identification is clear in all communications**. If you are emailing or messaging your instructor or each other, please be sure they know who you are and what class you're in. That really helps with clear communication.
2. **Review what you wrote and try to interpret it objectively.** When we speak face-to-face and are misunderstood, we have an on-the-spot opportunity to rephrase our words. In writing, we must strive twice as hard to be

understood, as we do not have the benefit of modifying or elaborating in real-time. All caps ("I'M SHOUTING") and exclamation points ("Give me a break!!!") can be misinterpreted as intense anger or humor without the appropriate context.

3. **If you wouldn't say it face-to-face, don't say it online.** When you're working online, you're safe behind a screen, but that's no excuse to be ill-mannered or say things you would never say in public.
4. **Use emoticons when appropriate.** In casual chatroom settings, emoticons can help convey feelings that may otherwise get lost in translation, including humor, exasperation, exhaustion, and even confusion. These aren't the best choices for formal assignments or projects, though.
5. **Respect others' voices and be kind.** We all come from different backgrounds and have our own stories. Assume the best of each other and always be kind in your communication.
6. **Remember, if it's on the internet, it's everywhere.** Don't share personal information about yourself in a public online forum, especially something that could put your safety or security at risk.
7. **Practice Patience:** All your facilitators are doing their best to grade work in a timely manner. We also want to give you meaningful feedback, which takes some time. If you feel like there has been an error or an assignment was missed, please reach out with your name and class, and we will do our best to sort it out.

GRADING

Each assignment is given a specific number of points. The number of points earned by the student is determined, and a percentage is calculated. The raw score is recorded in the grade book.

An overall grade in the course will be determined according to your school's grading scale.

SUBMITTING ASSIGNMENTS

All work must be submitted to Brightspace, our learning management system. This is very important for record-keeping and compliance. You have access to directions on how to do this in the 'Course Resources' folder of this class and in your Orientation class. If you need any help submitting work, please reach out to your instructor, and we will make time to ensure that you're able to turn in work to Brightspace.

HONESTY AND PLAGIARISM

Plagiarism of any sort is prohibited.

According to the Merriam-Webster online dictionary, to "plagiarize" means:

- to steal and pass off (the ideas or words of another) as one's own
- to use (another's production) without crediting the source
- to commit literary theft
- to present a new and original idea or product derived from an existing source

Please review THIS RESOURCE for more information on plagiarism.
Any plagiarized work will be given a zero and referred to your EF/COACH/GUIDE for review. From there, we will work with you to support you as best we can.

PRIVACY POLICY

All work submitted is the property of the author and is not available to anyone not in the class. If work is to be submitted or viewed outside of this website, I will obtain permission from the author. FERPA Info