Principles of Engineering (POE)

DMACC EGT 410 (3 cr.)

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ACHS (Rm 1509)
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What is Principles of Engineering all about?

"POE" is part of a series of classes that belong to a national program called Project Lead the Way. This program seeks to get students interested in engineering by providing a *project-based* curriculum that is both *fun* and *challenging*.

Each unit follows the same general format -- A unit starts with the introduction of a long-term project goal, such as designing a robot that sorts marbles by color, or creating a ping-pong ball launcher that can hit a given target from 5-20 feet away. With that goal in mind, daily lessons help students learn the math, science, and technology skills necessary to complete the project. At the end of the skills lessons, students work in partners or teams to design, build, and test their creations.

Major Objectives

- Use the design process to take an idea from a concept to a final product, documenting the process along the way with sketches and written descriptions.
- Formulate informed *judgments* about ideas under discussion and support those judgments with convincing *evidence* and *reasoning.*
- Deliver oral presentations with poise and clarity.
- Understand the importance of *revision* and practice this process to produce high quality work.
- Increase scientific and technical vocabulary and knowledge to enable application to real-life situations.
- Become both a *leader* and *team member* who consistently encourages and supports his/her classmates to do their best.

Student Supplies Needed

1. An **engineering notebook** - Needs to be a bound composition notebook (not spiral or tear-out) with graph paper (not lined paper). Also known as a "quad-ruled notebook".
2. A **scientific calculator** (must have sin, cos, and tan – we'll be doing some trigonometry!)
3. **BLACK pens** – all writing in engineering notebook must be done in black ink

College Credit for POE

POE is a rigorous college-level course where students *can* earn credit from DMACC (EGT 410) and have the opportunity to earn credit from the University of Iowa or Iowa State University. *Plan for substantial out of class work time to be successful in POE.*

Professionalism

The field of engineering requires individuals to be professional and responsible. This includes contributing to your team, using materials and tools properly, maintaining an organized workspace, being prepared with all materials, keeping up to date with online portions, and documenting your work in your engineer's notebook. *Remember – this class is designed to help you learn about the fields of engineering. One thing that all engineers have in common, regardless of type, is that they are prepared and professional!*

Grading Scale:

Letter	Min. %
A	92.5%
A-	89.5%
B+	86.5%
B	82.5%
B-	79.5%
C+	76.5%
C	72.5%
C-	69.5%
D+	66.5%
D	62.5%
D-	59.5%

Grading for POE

Your **18-WEEK GRADE** will be calculated based on two main categories: **Process** and **Product**. Professional behavior is also expected of you as an up-and-coming engineer or STEM professional, but it will not *directly* impact your grade.

PROCESS (0% weight)	**PRODUCT** (100% weight)	**Professional Behaviors**
• Activity Worksheets & Other Assigned HW • Quizzes (In and out of class) *(Communication of your work and practice is critical as an engineer.)*	• Engineering Notebooks - Thorough documentation of projects and other class activities • Performance of your design *(how well it meets design criteria & constraints)* • Presentations and Reports • Unit Tests / Assessments	• On-time work completion • Preparation for class • In-class focus on work • Collaboration • Professionalism • Responsibility • Respectfulness

Your **SEMESTER GRADE** will be composed of your 18-week grade (90%) and your semester final exam (10%).

◊ **No Extra Credit:** To ensure that grades reflect progress toward and achievement of the standards, giving extra credit points or bonus points will not occur in this class.

◊ **Assessment Retakes:** Assessment retakes are allowed (with certain conditions) in order for students to demonstrate higher levels of achievement. One requirement to retake is that all work is completed prior to the initial assessment (including homework, quizzes, and projects). Retakes are not "free points", they are an opportunity to learn by keeping up in the class expectations. Additional opportunities may include retakes of an alternate form of an assessment (e.g., Form B instead of Form A), student revisions of work products based on descriptive feedback, or alternative methods of assessments (e.g., an oral response rather than a written test).

Guidelines for retakes include the following:

- Students will be provided the opportunity to be reassessed pending requirements.
- Teachers determine appropriateness and authentic need for reassessments.
- Reassessment method will be provided at the discretion of the teacher.
- Retakes will be taken within a reasonable time frame that the teacher determines and informs students of in advance.

◊ **Independent Practice:**

- In our current reality, much of the work is to be done during remote learning days. Expectations and dates will be clearly provided through the course progression. Though the work is not explicitly graded, these assignments are crucial to success in the class.
- Documentation of your work is required in this class as this is a professional behavior that is expected of engineers and other professionals in technical fields.
- Missing work will be marked in the grade book as either (I) Incomplete or (M) Missing. Work showing either of these marks is expected to be completed.
- Late work will be recorded in Infinite Campus as (L) Late.

◊ **Formative and Summative Assessment Definitions:**

- Formative Assessment: Formal and informal processes teachers and students use to gather evidence for the purpose of improving learning.
- Summative Assessment: Assessments that provide evidence of student achievement for the purpose of making a judgment about student competence or program effectiveness.

Behavioral Expectations

The work habits/behavior standards are for grades 6-12 courses in our district. These work habits/behavior standards will be reported throughout the semester and are as follows:

- Organization and Readiness
- Productivity and Accountability
- Collaboration Skills

We will be using the following performance levels:

Performance Levels for Work Habits/Behavior Standards			
MS	PM	DM	NE
Meets Standard	Partially Meets Standard	Doesn't Meet Standard	No Evidence

*** These descriptors are intended for **feedback** and **communication** and do not impact a student's GPA.*

Tips for Success

When in doubt, ASK QUESTIONS! Ask me, your partner, your parents, an engineer, or look it up in a book or online. If you find something interesting, share it with the rest of the class. POE is all about teamwork and problem solving, but teamwork starts with individual drive and initiative. **Take responsibility for your education and make the most of your time in this class.**

Though face-to-face meetings will be rare, there are many methods of getting help. Each Slide Deck will have alternate or extra methods of learning and a form is prepared to collect questions. Should the need and opportunity arise, I am open to meeting virtually after school. Below is some information that might allow you to locate me if you need help.

Teacher	Other classroom	Planning / PLC Periods
Mr. Anderson	Physics Lab (2406)	1st and 3rd

I can almost guarantee that at some point during this year you will feel frustrated, stumped, disappointed, or just plain angry about a project or lesson. Don't worry! It's all part of the engineering process and it will make your successes that much sweeter. If a problem has you stuck, take a break and do something that you enjoy and find relaxing. Sometimes the best ideas will come to you when you're not stressing about it.

Welcome to Principles of Engineering! Let's have a great year!