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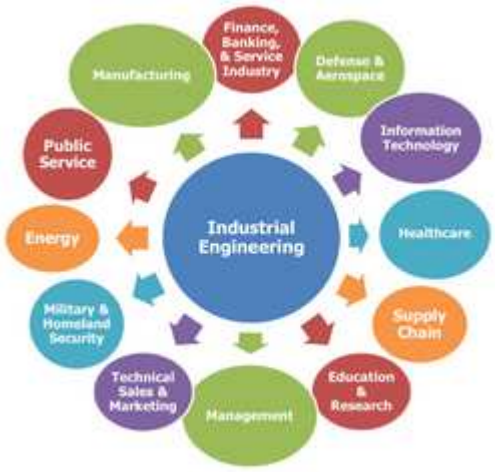
Industrial Engineering



Every month, we feature a different type of engineer so that you can see all the ways that engineers improve our world. This month, we focus on Industrial Engineering.

Industrial Engineers find ways to make processes and systems run as efficiently as possible. They work to eliminate wastes of time, money, materials, person-hours, energy, and other resources that do not generate value. They juggle designs, materials, machines, and information to keep industrial processes functioning smoothly.

An Industrial Engineer's technical problem-solving skills make her an ideal project manager. Project Managers ensure that various disciplines work together and meet cost and performance goals. That requires a deep working knowledge of all technical areas.

Industrial Engineers create and run systems essential to society. Look at all the industries where an Industrial Engineer can work and make a difference in the world.

Meet Alyssa, Industrial Engineering student

Alyssa is a senior at California Polytechnic University Pomona studying Industrial Engineering. Initially, she studied Electrical Engineering because the first engineering course she took in high school was a Project Lead the Way class called "Digital Circuits" and she fell in love with breadboarding and Boolean algebra.

After a few financial and personal hardships, Alyssa thought she wanted to stop studying engineering. That mentality didn't last very long. But she did switch to Industrial Engineering and has been blasting along since.

Along with being a student, Alyssa found a passion to advocate for change and be a leader on her campus. She first joined Cal Poly Pomona's Society of Women Engineers (SWE) section as the Freshmen Representative and earned other positions through the years such as Vice President of External Affairs and President.

STEM Outreach to young students was one of her favorite things to do because she loved having to organize an entire day's event for hundreds of curious and creative kids. She found that the fulfillment of a successful event was so rewarding!

She has also been a part of other clubs on campus including serving as the President for The International Council on Systems Engineering and being one of two Program Managers on the Northrop Grumman Collaboration Project.

Alyssa's involvement earned her scholarships from Exxon Mobil and her department, sponsored by Boeing. She has also had an internship at S. Bravo Systems. Through all of these experiences, Alyssa learned how to be an effective leader, the expectations industry has for engineers, and that communication really is key. Alyssa says, "The most important thing is that you have to be good to people and make sure that you work hard to get where you want to be.

New Girl Scouts engineering badges

Engineering, computer science, and robotics, oh my!
Read more about Girl Scouts badges here.

Computer Science | Cybersecurity: Girls learn how computers and the internet work and apply the concepts of safety and protection to the technology they use every day.

Engineering | Mechanical Engineering: Girls use design thinking to complete hands-on Mechanical Engineering design challenges.

Engineering | Robotics: Girls learn how robots are designed, built, and programmed. "Unplugged" activities allow girls to earn badges without kits.

Space Science: Girls learn all about the Solar System and our place in it. Just like real space scientists, girls explore, observe, and investigate the sun, moon, and stars and discover that space is bigger and even more exciting than they may have imagined.

Want to know how to start a SWENext Club?

SWENext Clubs are a way to connect with SWE members and other SWENexters in your area. Your SWENext club can be any size with students in K-12 grades. You can work on projects that use engineering to help people in your community, or compete in a competition like the Future City Competition or FIRST Robotics Competition. The direction of your club is up to you!

To learn more about how to start a SWENext Club, **check out this helpful guide.** Questions about SWENext Clubs? Contact us at **swenextclubs@gmail.com**.

Did you know? November 8 is NATIONAL S.T.E.M./S.T.E.A.M. DAY!

Tell us why you love STEM (Science, Technology, Engineering, and Math) and be featured in the newsletter. Send your answer to **swenext@swe.org**.

Participate in the SWENext Engineering Challenge by December 5

Industrial Engineering is about figuring out how to do tasks better. Industrial Engineers combine math, science, and social science with engineering principles to improve complex processes, systems, or organizations. Their work can improve the quality of a company's product or how efficiently they run a process. They might work to improve the productivity of manufacturing equipment that makes batteries for cell phones, or help a busy doctor's office plan schedules for patient visits and surgeries.

We're challenging you to think like an Industrial Engineer by preparing five snack packs in the shortest amount of time. If you prep your snacks like this on the weekend, you could have one per weekday to bring to school with you!

You'll need the following materials:

- Ziploc bags (snack or sandwich size, depending on your preference).
- Non-perishable snack items: pretzels, crackers, nuts, dried fruit, or whatever you love to eat that goes well together.
- Timing device (watch, phone, etc.).
- Pen and paper to record activity plans and times.

Now, follow the steps below to plan out and execute your snack packing procedure:

- Put your bags and boxes of Ziploc bags and snacks on the counter. Don't open them until your timed trials start!
- Write out at least two possible snack packing procedures. Some suggestions are below, but since you are the Industrial Engineer, the procedure design is up to you.
    - First you might try packing snack bags one by one by grabbing food items straight from their individual containers and putting them in bags.
    - Your second procedure could involve sorting out the food items for each snack pack on a plate or paper towel before putting them in Ziploc bags.
- Time yourself packing the snacks bags following your first procedure at least twice.
- Time yourself packing the snack bags following your second procedure at least twice.
- Compare the time it took to assemble the snack packs by your first versus your second procedure.
    - Calculate the average time it took to follow each procedure by adding up the two (or more) times you did each one and dividing that sum it by the number of trials you did.
    - Compare the averages for each procedure. Which one was faster? Why do you think it worked more efficiently?

When you are all done, tell us about your fastest procedure and why you think it worked more efficiently. **Please email your entry to swenext@swe.org by December 5. Each month, a lucky winner will be selected from the submissions to win a SWENext freebie.** Don't miss the chance! All it takes is a few minutes.

Shout out to last month's SWENext Engineering Challenge winner

The lucky winner for October's Agricultural Engineering challenge is the Lindbergh SWENext Club from Peoria, Illinois. They found that Aloe was the best preservative for strawberries.

Congratulations! Your awesome freebies are on the way.

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