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### What is Nuclear Engineering?

Pop Quiz: What field uses the same science to both save lives and find alternative energy forms? Nuclear Engineering!

Most of us go through our lives without even realizing the impact that Nuclear Engineering has on our world: medicine, security, the environment, and energy. [Learn more here.](#)

Many energy companies are dedicating more of their resources to finding alternatives to fossil fuels, and nuclear power is one of them. Nuclear power releases [fewer greenhouse gases](#) into the atmosphere than fossil fuels.

Nuclear Engineering has also contributed to many important developments in the medical world. Radioactive imaging techniques are used to give us a better idea of what the inside of our bodies looks like – without any incisions! This can help us detect problems such as tumors. Radioactive substances are also being used as treatments to break down these tumors. To learn more about Nuclear Engineering you can read this [LiveScience](#) article!

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### A Day in the Life of a Nuclear Engineer

Meet Liz Getto, a professor and researcher at the US Naval Academy. [Find out](#) how she got there, the types of projects she's working on, and how you can #BeThatEngineer on SWE's *All Together* Blog.



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### More Advice from a Nuclear Engineer

Kristin Weibel has a Bachelor's degree in Nuclear Engineering from Purdue University, and a Master's degree in Health Physics from the Illinois Institute of Technology. She describes her transition from engineering school to her career.

"When considering what major I wanted to pursue in college, Nuclear Engineering was my first choice because it combined all of my known interests. Engineering school is challenging, but it strengthened my ability to persevere and morphed me into a creative problem solver. Nuclear Engineering is one of the smaller engineering disciplines, which is nice because you get to know your classmates well. My classmates and I worked together often on homework and projects, and now have created an amazing professional network across many different companies.



I always assumed that I would work at a nuclear power plant after college. Between my junior and senior year of college, I was an intern in the Radiation Protection Department at a nuclear power plant. I learned a lot about how to practically apply what I had learned in school. I was offered a full time job after graduation and became so interested in the field that I decided to pursue my master's degree in Health Physics.

I currently work as a Health Physicist at a national laboratory. I am responsible for ensuring that researchers work with radioactive material safely and within the prescribed limits. I am frequently involved in safety reviews of research activities.

I enjoy my job because it gives me the ability to use my professional judgment to contribute to the growth of my team. Since there are various types of research that I support, my experience at work is different every day, which helps me to learn new things and keeps me interested in my job.

Engineering school, the engineering profession, and the health physics profession are all heavily male dominated. However, I have encountered more challenges as a young professional in engineering and health physics than I have as a woman. I have learned

that having confidence in your knowledge and abilities is the best tool for overcoming adversity in the workplace."

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### **Help SWE Conduct Important Research!**

SWE researchers are collaborating with researchers from The University of Texas at Austin to conduct research on young women's interest in engineering through a study supported by the National Science Foundation.

They are looking for SWENexters who are in high school and would be willing to participate in their study. The purpose of the study is to learn more about young women's opinions and experiences with engineering and other STEM fields, and help the researchers understand how to better support their interests. The study involves an online survey and a phone interview. All participants who complete the survey will be entered in a drawing for a tablet. Participants who complete a phone interview will receive a \$25 gift card from Amazon.

Parents: If you would like to learn more about the study, or have your daughter participate in the study, [\*\*click this link\*\*](#). A parent signing up the high school student is the required first step.

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### **SWENext Competitions – Part 1**

Do you live near Baltimore, St. Louis, or Denver? If so, try the **SWENext DesignLab Community Engagement Challenge!**

Teams of high school students have the chance of winning \$1,000 to implement a community engineering project! **Your initial "entry" proposal is due by December 23, 2018.**

If accepted, your team would present your proposal to women engineers at the DesignLab near you: Baltimore on February 9, St. Louis on March 2, or Denver on March 16, 2019. Here are the steps and rules.

#### **Step 1: Download and read the Proposal Brief.**

This will provide you an understanding of the challenge objectives and requirements.

#### **Step 2: Assemble your team.**

Your team must consist of 5-15 high school students and one faculty member. At least 50% of your team must identify as female.

#### **Step 3: Identify an economic or environmental community need that can be solved using engineering.**

**Submit an entry proposal** describing the problem by **December 23, 2018**. The entry proposal is an expression of interest to provide contact information, receive necessary resources and be paired with a SWE Advisor. You will also be asked to provide basic information about a community issue your team is interested in exploring.

**Step 4: Meet your SWE advisor.**

SWE will connect you with a SWE member in your local area to help your team design your service project.

**Step 5: Outline your project.**

**Your Design Outline** will detail the community issue identified and a hands-on engineering activity that can solve this issue. Templates will be provided. **The Design Outline is due February 1, 2019.**

**Step 6: Present your project at DesignLab.**

You and your team will have five minutes to present your project to a panel of women engineers and program sponsors at DesignLab in Baltimore, Denver or St. Louis.

**Step 7: Implement your service project.**

The top three teams in each city will receive a \$1,000 grant from SWE to actually implement their service project in the community, partnering with a local middle school to engage students in STEM.

**Step 8: Share your experience with SWE.**

Then, the nine winning teams will submit videos of their activity and service project to enter the final round. The winning team will receive an all-expense paid trip to SWE's annual conference, WE19, in Anaheim, California, in November 2019.

Questions? Feel free to reach out to Sabrena Lopez, SWE Student Programs Coordinator, at [sabrena.lopez@swe.org](mailto:sabrena.lopez@swe.org).

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## **SWENext Competitions – Part 2**

Do you live near Baltimore, St. Louis, Denver, or Bellevue, Washington? Are you a girl in 6th through 12th grade who is actively interested in STEM and is out doing something in your community about it, for example participating in a STEM competition or a SWENext club, raising awareness, or mentoring students?

If so, apply for a SWENext Community Award!

Winners will attend a SWENext event where they will meet and network with women engineers and engineering students, learn about how to get the most from your SWENext membership and about bias literacy, and receive a certificate of achievement and a commemorative shirt.

[Learn more and apply here >>](#)

**Deadlines for submitting your application:**

Baltimore: Application due January 19, 2019

St. Louis: Application due: February 9, 2019

Denver: Application due: February 23, 2019

Bellevue Washington: Application due: March 16, 2019

We can't wait to read about all the great things you are doing!

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### **The Down Side of Perfectionism**

From our childhood, we are trained to do our best. We're taught to review things before submitting them, to double check our answers, and to think carefully before starting.

According to a study done by Danielle Molnar at Brock University in Canada, there are three types of perfectionism – self-imposed, socially imposed, and other imposed.

- Self-imposed is when you hold yourself to a standard of perfection solely for your own benefit.
- Socially imposed is when you hold yourself to a standard of perfection because you believe others expect it.
- Other imposed is when someone else holds you to a standard of perfection.

It is good to have high standards for ourselves. This allows us to produce our best work and achieve our goals. However, perfectionism can often go too far.

When perfectionism goes too far, we risk limiting innovation. We also miss out on the opportunity to learn more about our world. Many people, when faced with the options of trying and possibly failing, or not trying at all, will choose the latter. But so many discoveries and inventions have come from repeated trials adjusted to account from the failures of the past. **Many inventions have been the direct result of mistakes!**

The scientific method even allows for mistakes – you make a hypothesis, test your hypothesis, and then reframe your hypothesis based on the results of your test.

Perfectionism can also lead to unnecessary stress that can have negative impacts on your health. If you never allow room for mistakes, it can be very difficult to appreciate what you have done right and acknowledge your successes.

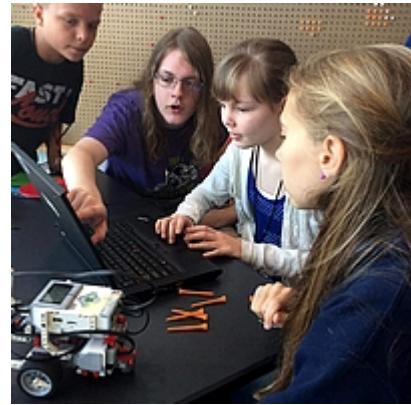
So next time you're afraid of making mistakes, remember it's a great learning experience!

[To learn more about Perfectionism see this article >>](#)

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We are continuing our plan to feature a new SWENext Club every month. This month we are featuring the **Pitt County Robotics SWENext Club**.

The 9 to 12th graders of the Pitt County Robotics SWENext Club truly embody the mission of For Inspiration and Recognition of Science and Technology, most commonly known as FIRST. FIRST is an international organization that brings robotics to students of all ages. The Pitt County Robotics SWENext Club was founded in 2016 in order to provide a stronger community for girls to be able to embrace STEM and inspire them to pursue STEM careers.



The Club is a mix of all of the public schools in Pitt County, North Carolina. Most of its members are from two different FIRST Robotics Competition (FRC) Teams, the Pitt Pirates (FRC 2642) and Boneyard (FRC 2682). The Pitt Pirates began 11 years ago and has been to the world competition 5 times! The Pitt Pirates helped start and mentor Boneyard for the last 5 years. Boneyard has been to the world competition twice! Exciting things are ahead for the SWENexters on both teams, as the upcoming FIRST Robotics Competition season, Deep Space, kicks off in January 2019!



The over 70 members have initiated outreach programs at home and across the globe. They have developed summer camps for elementary and middle school students to learn how to build SumoBots and program EV3 Mindstorms bots and WeDo 2.0's. The SWENexters love working with the younger students and encouraging them to become creative thinkers. From working with schools in Central America to collaborating with FIRST teams in Turkey to provide SumoBot kits to Syrian refugee camps, these SWENexters are bringing SWE, FIRST, and STEM to other students just like them!

Want to learn more about FIRST? Click here >>

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### SWENext Social Media Challenge with a Chance to Win a \$25 Amazon Gift Card!

Since December marks the beginning of winter in the northern hemisphere, we're challenging you to think of some precautions you take to be safe in the colder, possibly snowier weather.

An example of a safety precaution is wearing gloves. If it's really cold outside, you could get frost bite on your fingers!



Take a picture of something you or your family does to be safe during the winter time and share it with us!

**Post it by January 4th on our closed High School SWENexter Facebook group page. #BeThatEngineer**

The winning SWENexter will be selected by random from all entries and will win a \$25 Amazon gift card.

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**Did you know? SWENext is on YouTube!**

Subscribe at **SWENext YouTube Channel** to make sure you don't miss any new upcoming videos.



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