The Institution of Engineering and Technology

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Partner Spotlight

A Junior Engineer Case Study

IET Corporate Partner

Introducing Cailey Miller...

A former Apprentice of the Year and Silver Medalist at the WorldSkillsUK final, Cailey talks to us about her career so far and her future aspirations in STEM.

> During my work experience I spent time with all the disciplines within the business, including Mechanical, Civil/ Structural/Architectural, Process, HVAC, and Electrical. Each has a different role to play within Engineering as a department.

In conversation with... Engineering Apprentice Cailey Miller from NUVIA UK

When did you decide you wanted to become an Engineer?

I have always been interested in STEM from an early age. Throughout school I particularly engaged more with the sciences and maths in comparison to the more creative subjects like English and music. For that reason, it only seemed natural that I pursue a career in STEM. When it came to honing in on one of the four academic disciplines, Engineering was an easy choice since I have always had a passion for problem-solving and often questioned how things worked.

Was there anything during your childhood that influenced your career choice?

Growing up I was dead set on going to university and studying medicine. At the time apprenticeships didn't seem that common unless you were wanting to go into a trade. My dad started out his career as an Engineer, but as a child I never really took an interest in what he did! It wasn't until I started playing rugby at 15 years old and my coach told me she was an Engineer that I started to consider it as a career choice. As a result, I finally spoke to my dad about wanting to become an Engineer.

Was there any reason you chose Mechanical Engineering in particular?

I attended a week of work experience at NUVIA UK at the start of my final year of school. The company came into the school for a careers fair and their stall, in particular, caught my eye. After speaking to the NUVIA UK apprentices at the time, they handed me an application letter for work experience and prompted me to apply. During my work experience I spent time with all the disciplines within the business, including Mechanical, Civil/ Structural/Architectural, Process, HVAC, and Electrical. Each has a different role to play within Engineering as a department. By the end of the week, I had spoken to a multitude of people in the business about how they found themselves in the role they were in, and the most popular response was the apprenticeship route. I learned that NUVIA UK offered apprenticeships for students straight from high school in both Mechanical and Electrical Engineering. After spending some time reflecting on which of the two I enjoyed the most, it was Mechanical Engineering that came out on top.

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How are you finding your Apprenticeship thus far and what work/projects are you involved in?

I am currently part of a team responsible for the design of a Waste Transfer Area (WTA) that will provide Intermediate Level Waste (ILW) packaging facilities for the Dungeness A Site. In addition to learning how the integrated process will work, I have been assisting the Civil/Structural team specifically with the production of the shield wall and process platforms. It has been great to work under a different discipline as it has helped to broaden my engineering knowledge.

What has been a stand out moment in your career so far?

I have been fortunate enough to have a couple standout moments so far. The first one was being awarded Apprentice of the Year from my training provider after the first year of training had been completed. Another standout moment for me was winning the silver medal at the WorldSkillsUK National Final in the Mechanical Engineering: CAD category, which subsequently led to being invited to join the SquadUK and train for a chance to go to the WorldSkills International Skills Competition in Shanghai later this year.

What do you enjoy most about engineering?

I think for me Engineering has sparked a level of creativity and thinking that I didn't know I was capable of. I really enjoy the problem-solving aspect of it and the opportunity we're given to design something that will be manufactured and utilised in projects all over the world. It is especially rewarding when the drawing pack you have been working on finally gets approved for issue to the client and the manufacturing phase commences. I'm looking forward to seeing some of my work get manufactured and be operational.

Can you give us an example of something you achieved on a past project?

When I came into the office after my first year of training in the workshop full time, I was put onto a project known as ESS (European Spallation Source), which is an experimental accelerator facility in Sweden. During my time working on ESS, I developed and produced Autodesk Inventor models alongside a full detailed design for manufacture drawing pack for a key piece of mechanical equipment within the plant (Cask 7). This was one of seven shielded transportation casks, comprising of a hoist, shielded body, gamma gate and onboard electrical equipment, with the purpose of retrieving and transporting highly radioactive components within the nuclear facility. My efforts were recognised by a Senior Engineer, who subsequently nominated me for an award stating, "Cailey is nominated for her skills beyond her training years (2 years). Cailey produces designs which are of the standard of someone much further advanced in their career, demonstrating excellent drive and performance." This was a huge accomplishment for me as I was already proud of the work I produced, and having it acknowledged by others only validated this feeling.

Tell me about the most challenging engineering project or task that you have been involved with?

I would say the most challenging project I have worked on so far has to be the ITP (Item Transport Package) project. The mass and magnitude of the ITP brought some unique engineering challenges since it also had to be transported along the road. It was important that the package met the requirements laid out by the Road Vehicles Regulations, which meant that the concept design had to go through rigorous simulation testing to verify its capability. I found it personally challenging as I had little experience working with these regulations, so reading them and extracting all the relevant information was tough at first.

ITP was also the first project I had worked on where I had to personally liaise with other disciplines within the business. The equipment I had designed was analysed by the company's structural analysis team, and I had an opportunity to support calculation production to ensure the equipment met its functional requirements. A human factors assessment was also undertaken, which meant I had to provide sufficient models and also make updates to the design as per the results of the assessment. Speaking to others in a technical capacity was something I was, initially, not overly confident with, which is why it was challenging; however, the exposure I got from doing this on ITP has really helped me with my confidence moving forward.

What new engineering skill have you developed or honed in the last year?

During the past year, I have really developed my skills for producing detail mechanical drawings using the Inventor software. This is as a result of the project experience I have gained and has been further supplemented by the additional training I have received from WorldSkills CAD Experts. The knowledge I have gained has meant that I have been able to develop 3D models in a manner that maximises the benefits of the software when pulling through the data onto detail drawings.

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What's the most valuable lesson you have learned in your career so far?

The most valuable lesson for me has been that regardless of your experience, your opinion will still be listened to. When I first started working on projects, I was convinced that people wouldn't really care about what I had to say since I had no experience. As time went on however, and my confidence grew, I became more and more comfortable bringing my own ideas to the table and was proud when they started to be adopted as part of the final design.

Another lesson I've learnt is that you mustn't be afraid of asking questions, regardless of how silly you think it is. Asking questions is the most efficient way to learn. When people can see your enthusiasm and that you care about your work, they are much more likely to invest their time to help you develop.

What are your aspirations and plans for your career and where do you see yourself in five years time?

In five years, I hope to be completing the final year of a MSc degree in Mechanical Engineering after having successfully completed a BEng Degree. I will have five more years of experience on different projects so will hopefully be a Design Engineer by then. My ultimate goal at this point is to become a Chartered Engineer.

What do you think makes a successful engineer?

I think a successful engineer is someone who is technically competent and also has great soft skills, meaning they can communicate well and have little difficulty leading others. Attention to detail is also important since the margin for error in our industry is often quite small.

What engineering resources do you use to stay on top of the latest news, technology and developments in the field?

As well as being an Apprentice Member of the IET, I am also an Apprentice Affiliate Member of the IMechE. I am registered with the BSI Group and receive regular updates about any changes to standards and regulations. NUVIA UK send out regular communications detailing any upcoming events, meetings, conferences, and webinars relevant to the industry. I also receive magazines/ newsletters in the post from The IET which make for an interesting read.

Do you have any development goals or plans for Professional Registration?

I have already looked into Professional Registration, with my ultimate goal being to become a Chartered Engineer.

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