



Career Spotlight Series

Women in Engineering

WISEatlantic



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Introduction

Dear Reader:

I am so excited that you have picked up this booklet. This booklet profiles diverse Women in Engineering and is filled with inspiring stories about ordinary women who followed their dreams and passions to become successful engineers. Some of these women faced hurdles in their pathways, but they climbed over them with support from others, and have made it into these exciting careers.

This is the second booklet in our Science, Engineering, Trades and Technology (SETT) series.

We could not feature every woman in Science, Engineering, and Technology that we know in our booklet series, and have selected just a few to give you a snapshot into their lives and their career paths.

These booklets are also available on our website for download at www.WISEatlantic.ca

All the women featured were interviewed while working in Atlantic Canada. I hope you enjoy reading these wonderful stories.

Follow your passions and keep doing what you love to do, and you will find a fulfilling career suited to you!

Tamara Franz-Odendaal, PhD
Professor of Biology
Mount Saint Vincent University

Biomedical Engineer



Sarah Wells

Dalhousie University

Sarah is currently working as an Associate Professor in the School of Biomedical Engineering at Dalhousie University. She is also an Assistant Dean in the Faculty of Medicine in charge of the Bachelor of Science and Medical Science programs. Sarah's current research involves the study of artificial heart valves, specifically the maternal (mother) heart and how heart valves are remodeled during pregnancy.

Career/Educational Path

Sarah's current career as a Biomedical Engineer began in grade 11 when she competed in a regional science fair and won a job in the Department of Biophysics at Western University. The first day of her summer job she knew that this was what she wanted to do. She worked as a summer student in that department throughout high school and university and did a four-year undergrad in Biophysics in that same Department. She went on to do a Masters degree in Materials Engineering at the University of Toronto and after two years transferred into a PhD in Materials and Biomedical Engineering. She then spent one-year in post-doctoral training in the Bio Engineering Department at the University of Pittsburgh (USA). She also did a teaching certificate. She noted that you get a salary while doing your PhD and you can also obtain scholarships. Sarah really enjoyed graduate school because you get hands on experience.

Sarah taught physics for 18 years and now has shifted over to Biomedical Engineering which falls under both medicine and engineering. She is also an Assistant Dean for 50% of her time.



Sarah's day-to-day work changes depending on the time of year. Part of the year she is teaching, preparing lectures and grading assignments. Other times she is in the laboratory doing research, designing new pieces of equipment, analyzing data, designing new studies, or writing research grants. Sarah spends a lot of time writing grant proposals and publishing results of her experiments or her team's experiments. Sarah is also the Associate Editor for an academic journal – Cardiovascular, Engineering and Technology.

Sarah's job is very interesting - one day she might be presenting at an international conference and another day she might be collecting cow hearts to use in experiments. You could be in front of a lecture hall of 300 students, or on the floor rewiring something in your lab, or supervising and meeting with students.

In the beginning when she was establishing her lab, Sarah had to do almost everything, from research work, studying heart valves, arteries and tendons from cattle, to spending a day in the field collecting cow parts.



Qualities and Skills

Qualities or skills that are a good fit for Sarah's career are patience, persistence, flexibility and resilience. You have to be very persistent, but if an experiment doesn't work you can still learn something from that experience. A negative result is still a result – and you move onto the next thing. You should also have good communication and writing skills to convey your results across a variety of disciplines and to a variety of audiences.

Sarah describes herself as analytical, naturally curious, adventuresome, imaginative, innovative, and creative – which is helpful when trying to figure out new ways of testing hypotheses.

Career Highlights:

The **most interesting and exciting project** Sarah has been involved with so far is studying artificial heart valves. Specifically, she is examining the maternal (mother) heart and how heart valves remodel during pregnancy. Engineered valves are great for 10 years, but once they start to fail there is no way to repair them. In pregnancy, the blood volume and maternal circulation goes up by 50%, therefore, the heart gets larger and the valve openings get larger. All of this increases the stresses on the heart valve leaflets and if the heart valves are like any other soft tissue, they should remodel and get bigger and stronger. Her hypothesis was that in pregnancy, women don't die of heart failure because heart valves remodel in pregnancy. To conduct her study she had to obtain hearts from cattle that are pregnant and not pregnant. It has taken years to conduct the study but being able to combine all her different areas of science has been very exciting.

Sarah's advice for young girls is if you want to do science then do it. If you are the only girl, it doesn't matter. Be the only girl. Maybe you have to be the role model. Don't be afraid and don't worry about what people think.



According to Sarah, the **most enjoyable part of her job** is seeing results from an experiment for the first time. "It's like Christmas morning!" You have an hypothesis about how an experiment is going to turn out but you don't know until all the data is collected, analyzed and interpreted. This can take days or weeks. It may not turn out the way you anticipated, but you are the first person on the planet seeing the results for the first time and that is always exciting.

Sarah's program of study in biophysics benefits her career as it led her to discover solutions to many important issues. It has also helped her realize the importance of combining different fields of science in her approaches to find solutions. She ended up with very broad multidisciplinary training that has been very useful to her success.

Career Impact

Sarah helps society and communities by helping people to understand the importance of science and the importance of discovery research. Pursuing science questions always opens new doors and brings up new questions that pave the road to developing new technology. Funding basic science research is valuable. She tries to inspire the next generation of scientists by getting students to be interested and engaged in science, and to encourage them to make science a career and to consider going into leadership positions.

Discoveries from her research have broader implications such as new applications to medical sciences and new treatments.

What surprised Sarah about her career is the range of experiences, opportunities and diversity of her job.



Sarah's **vision or dream for women** in the next 5 years is to see equal representation of men and women across all disciplines of research. Getting women into leadership positions is also important.

*Advice Sarah has for young women is to **stay with it if you are interested in it**. Don't think "I can't do this". Don't think that everyone else knows what they are doing and I am the only one who doesn't. Everyone is thinking the same thing. Stay with what you want to do. Don't be afraid to be the person to put your hand up in class and ask questions. Be persistent, but also don't be afraid to be a leader. Keep taking math and coding (computer science) as long as you possibly can – right through university because these are the languages of science and engineering. Having a solid foundation in math is also important.*

Aerospace Engineer



Rumbi Muvingi
Jazz Aviation

Rumbi is an Engineering Specialist with Jazz Aviation. Her role includes doing modifications to aircrafts, engineering design (making the drawings), analysis (figuring out if the changes will work) and certification which includes studying aviation regulations with Transport Canada to ensure any changes meet safety requirements and that the aircrafts are air worthy.

Career/Educational Path

Rumbi's career as an Aerospace Engineer stemmed from her keen interest in aviation and space. Frequent traveling to visit relatives across the UK and the US, as well as having a cousin who was one of the only female pilots in Zimbabwe, exposed Rumbi to lots of aircrafts. She said "the fact that this huge thing could go in the air and stay there fascinated her". She always wanted to be a pilot and an astronaut but couldn't due to eyesight issues. Rumbi's teachers suggested she go into engineering because she loved math and science and the hands-on experiments. When she looked into it she realized there are lots of types of engineering, but because of her interests she decided on aerospace engineering. It wasn't quite the exact role she thought she would be doing, but it's where she landed and it's pretty close.

Rumbi completed a 5 year undergrad in Engineering at Carleton University that included a year long co-op placement where she worked at an aviation company in Winnipeg.

What is co-op?

Co-op is a paid work placement at an industry, company, or academic lab where you learn on the job.

That is where she encountered aircraft modification and design. She discovered there is a whole other world to aviation, other than manufacturing, which she thought was awesome.

Qualities and Skills

Rumbi feels creativity, flexibility, good communication skills, being analytical and a good problem solver, are all skills necessary for a career in Aerospace Engineering. Rumbi describes herself as being open-minded and has a keen interest in math. She describes a particular project where she was asked if they could put external loads on a float plane such as a canoe or a ladder. At first, she didn't think it would be possible, but after analyzing the problem they came up with a solution.

Rumbi also said that teamwork is very important and that each member of her team has different strengths. Some of her team members are mechanics and others have technical degrees, but it is great to be able to pull from everyone's experiences.



Rumbi says **her favorite part of the job** is the variety of things she get to do - designing installation of new LED lights for the aircraft: making sure they will fit and work with the particular aircraft - to certification: ensuring the changes meet Transport Canada safety requirements. She gets to see the whole picture from start to finish.

Rumbi's vision or dream for women in her field of aviation is to see more women in her field, so that we can increase the quality of solutions and thus be able to see solutions from a woman's perspective too.



Career Highlights

Rumbi's **most enjoyable project** was changing out the landing lights from incandescent lights to high intensity LED lights - having to make sure they fit properly in the space that's there and that you wire it correctly so that the wires don't set themselves on fire - that was the first time she had to actually write a test plan and sit in the cockpit for the flight test – "it was pretty awesome!"

Another project Rumbi enjoyed was having to change the seat covers in the aircraft. There are a lot of regulations around flammability so she got to ask people to burn stuff in the name of science. The project took almost seven months, but it was great to see how much was involved in it.

Since the interview, Rumbi has switched roles and is now the Regional Aircraft Certification Engineer for Atlantic Region with Transport Canada (TC), where she continues her passion of ensuring aviation safely connects and serves Canadians. Her role is that of oversight (ensuring adherence to Canadian Aviation Regulations) and risk analysis of modification/repair designs on aircraft.



What **surprised Rumbi about her career** was the amount of times an aircraft gets modified and the variety of things that need to be done such as putting tracking antennas on the aircraft, cabin wifi systems, changing the layout.

Rumbi was also surprised that she needed good communication skills. When she entered engineering she quickly found out she would need good writing skills as there is a lot of report writing. She has to write reports with all the calculations, reports proving line by line with each regulation to show how the safety criteria are met and submit these to TC for regulatory approval.

Career Impact

Rumbi's work as an Engineering Specialist will help society and communities by ensuring aircrafts are safe even for those who don't fly. Aviation affects everyone – from aircraft flying over their community, to goods being flown into your area, to visiting your grandmother half way across the country.

Aviation also removes isolation in some areas of the country, especially where there are only ice roads. Aircraft can allow residents to get food and go to doctor's appointments. They can also function as a medivac system, for example if you need to get to a hospital.

Rumbi's program of study helped benefit her career – by giving her a base technical knowledge – the co-op piece was the most beneficial because that was the first time she got to put all the theory into practice and actually had to make something real. She got to see how aviation can be a lifeline for some communities and how important it is for our supply chain - getting food places, for example – and that is really cool.

*Rumbi's advice for women is that **nobody knows everything**. You will make mistakes and that's okay. You will have questions and there will be times when you don't know how to do something. Rumbi said she has had projects where she had no idea where to start but realized it's okay to ask questions. By asking questions you learn and sometimes you teach others as well.*

Rumbi also said that girls shouldn't discount engineering by thinking its only for people who like math. Engineering can be creative and involve lots of problem solving.



Environmental Engineer



Amy Pellerin

*Senior Development
Manager,
Natural Forces*

Amy is a Senior Development Manager with Natural Forces, a wind farm independent power producer. She develops, operates, and constructs renewable energy projects. Amy's role is to manage the development of all of their utility scale projects in Canada which can include accessing permits, consultations, wind resource assessments, site findings and compliance.

Career/Educational Path

Amy's current career as an Environmental Engineer stemmed from her keen interest in physics in high school. She also has a family member who is a Mechanical Engineer who suggested she may be good at engineering. Amy also liked that Environmental Engineering dealt with real situations and renewable energy. Amy grew up in Cole Harbour, NS and went to a French high school that only had 500 students from grades 7-12.

Amy's degree in Environmental Engineering at Dalhousie University took 4.5 years with 3 co-op terms of 4 months. During one of her co-op terms, Amy worked for Wind Prospect. After finishing her degree, she was hired by this company, now called Natural Forces.

On a typical day, Amy helps manage and supervise a team of five people and helps ensure everyone is meeting their timelines, and achieving project milestones in order for projects to be constructed on time and within budget.



On a weekly basis, Amy participates in meetings to update others, including community groups and First Nation communities, on her projects. She also enters into contracts and negotiates agreements with First Nations communities. Amy travels all over Canada, as well as to rural areas of Nova Scotia.

What **surprised** Amy about her career in Environmental Engineering was the low enrollment of women in the engineering field, but notes that it's changing for the better. Amy was also surprised about how many projects she is working on at one time and how fast technology advances and how quickly the industry has changed as a result. When she first started, she was reading paper maps and driving everywhere to find out where electrical lines were and now you can do it all from a computer. She said new staff rarely get out in the field, whereas she was out in the field 50% time when she first started. Advances in technology in general have really impacted the way she does her work and also the projects themselves are very different than they use to be.

Amy's program of study in Environmental Engineering helped benefit her career in that an engineering degree is a problem-solving degree. It teaches you how to solve problems from all sides and to look at a situation and analyze different angles. Her degree also opened her up to learn about all different industries and different energy types and not to get focused on just wind energy. It's important to know a lot about all sorts of things and relate different project aspects to other ones, such as helping lower gas emissions, diversify energy mix, and help communities receive long term renewable energy. University in general helped her learn about diverse subject matters and a lot of different science and math concepts.



Career Highlights

Amy's most **interesting and enjoyable project** to-date is a wind project in New Brunswick which is mainly owned by a First Nations community. She enjoyed working with the First Nations community and liked that they were very supportive of wind turbines. The First Nations Community benefits from the project, as the money will be used for building homes and other economic benefits.

According to Amy, her **favorite part of the job** is working with community groups and having discussions on renewable energy with other people interested in it. She loves working with First Nations communities as their values and her company's values align well. She said, "It is good to be able to collaborate with them on our projects and to have them be majority owners of our projects". It's a fast-moving industry and you get to go home and feel good about working towards less greenhouse gas emissions. "It's a feel-good job for sure".

If you are passionate about anything you need to put 100% into it to see it through. Don't let the naysayers in. Even if there is just a small chance that you can make it work in that field, you have to go for it.



Amy's advice for females pursuing a career in Environmental Engineering is to challenge yourself. Sometimes she had people tell her Engineering wasn't the right field for her when she was struggling with a subject, but she stayed with it. "Challenge others' opinions of what you should or should not be doing - even if you find it hard".

"Challenge yourself and don't be afraid to take on new tasks or something you may not be comfortable with. Talk to family and friends who have interesting careers or careers that you don't know about to help decide what you may want to do and ask lots of questions."

Qualities & Skills

Amy would describe herself as task-oriented, and a very logical person. She thinks in steps and likes working in a team. Amy also loves math and science and was thinking of Health Sciences initially but liked physics more than biology. Amy also enjoys working on all sorts of different projects and especially enjoys working with community groups. Amy loves taking something that people may not understand and explaining it in a way that it's easy for people to grasp.

Qualities and skills that are a good fit for an Environmental Engineer include being analytical, resourceful, and a team player. She enjoys working in a fast-paced environment, and is eager to step in and do a variety of tasks as they are needed. She has a passion for renewable energy.



Career Impact

Through her work as an Environmental Engineer, Amy helps society and communities by lowering gas emissions and diversifying the energy mix. In her current role Amy gets to influence positive change by collaborating with First Nations and community partners to ensure that the projects they do together match community values and create a revenue for the community.



Amy's vision or dream for women in her field is to have more women in renewable energy participating at all levels, including management and CEO roles, but also being owners of independent power producers. She would also like to see Indigenous women being part of the industry and have a big role in how projects are produced or manufactured.

Chemical Engineer



Browren Allard

*Senior Project
Manager,
Nova Scotia Power*

Browren manages large scale construction projects valued over \$1,000,000 which includes budgeting, design development, buying materials and services to execute the project, as well as scheduling and working with other interested parties (i.e. First Nation communities, local residents, etc.)

Career/Educational Path

Browren's current career as a Senior Project Manager stemmed from her love of math and science. In school she loved science labs where she took the scientific theory and turned it into something real, like silly putty or aspirin. She didn't really know what engineering was but knew other friends going into engineering so thought she would try it. The first year of your Bachelor of Engineering is very general and includes courses in physics, calculus, and chemistry and gives you exposure to every engineering discipline. The first year also meets all the basic requirements of a science degree if you changed your mind.

At Dalhousie, you don't have to decide which type of engineering to pursue until the 2nd year. In her second year she really liked chemistry so decided on Chemical Engineering. She said engineering teaches you how to think about a problem, develop solutions, test those solutions and implement scientific principles along the way. She said she doesn't design chemical reactors, but she could. It also teaches you how to deal with stress, as you are working on projects and designs that impact public safety.



Browren's degree at Dalhousie University took 5 years as she took the co-op option. Co-ops help you determine whether you will like certain jobs or if engineering is for you as it gives you experience in an industry or job site. After graduation, Browren took a 2 year MBA (Masters in Business Administration) at St. Mary's University to open up further job opportunities. She then went to rural Alberta to work for Husky Energy in one of their field locations for 2 years. She was offered a job in Calgary, but decided it wasn't for her. As she wanted to move back home, she ended up landing a job with Nova Scotia Power.

Browren grew up in the small Nova Scotian community of Riverport where she was the first person to pursue engineering.



Browren's day to day work changes continuously. No two days, or weeks, are the same depending on what project she is working on. She usually spends 80% of her time in her office and the other 20% at a construction site. A project manager is a problem solver. She solves problems, develops alternatives, makes recommendations, and identifies risks. There is a lot of paperwork involved, including large spread sheets, emails, and reports, as well as meetings to understand peoples needs.

On-site Browren meets with contractors to talk about safety, environmental issues, problems, next tasks and inspections.

Browren's current project with Nova Scotia Power is replacing a dam and notes time spent on site helps build relationships with contractors.

Career Highlight:

Browren's **most interesting project** has been with Nova Scotia Power working on a construction site as the junior project manager and on site representative converting an old decommissioned power plant on the Halifax Waterfront into office space. It was the first LEED platinum building in Atlantic Canada. There were lots of interesting environmental technologies that had to be implemented. She learned a lot about construction, how to read drawings, and it provided her with the best training for all her other projects.

Her second favorite project is her current project in Tusket, Nova Scotia, replacing a dam. It involves many challenges and a lot of local residents and interested parties who care about what happens to the fishery on the Tusket River. It also sits in the middle of a rural community and is surrounded by archaeological sites, so it has drawn a lot of media attention, resulting in Browren giving interviews to the press.

According to Browren, the **favorite part of her job** is that no two days are exactly the same. She has been in her current role for 11 years and although the job hasn't changed, the projects are always changing so they present her with new challenges. She loves being out in the field and loves being outside in general.

What is LEED?



LEED is a green building certification program used worldwide and includes a set of rating systems for the design, construction, operation, and maintenance of green buildings, homes and neighborhoods.

What **surprised** Browren about her career was the amount of paperwork and documentation. She is also surprised by how much time she spends working with her legal group discussing contracts, public safety issues and contractual obligations in case there is an issue down the road. She said when she was in engineering school she never had an appreciation for the business side of it all. That came with working and her MBA helped a lot too.

Qualities & Skills

Browren describes herself as a very logical and analytical person. She is organized and has a great attention to detail. She loves math because it has rules and is logical, but she is also curious and asks a lot of questions. She enjoys being outdoors, solving puzzles and problems.

Qualities and skills that are a good fit for a Project Manager are problem solving, detail-oriented, critical thinking, team player, and good communication skills - both written and verbal. She also said you shouldn't be afraid of heights, small spaces, or getting dirty!

Browren's program of study in Engineering helped benefit her career as it taught her how to think. She is comfortable with discussing complex topics, not always knowing the answer, but being able to work with other people and being able to figure out an answer, or solution.

Career Impact

Through her work as an engineer, Browren helps society and communities directly as her work touches everyone in Nova Scotia. Her role is to ensure there is renewable power being generated for all Nova Scotians, working to ensure that the electricity supply is available and reliable and is there when they need it. She also works to ensure that the 90-100 year old hydro systems are still safe by bringing those structures up to safety standards.

Browren's vision or dream for women in her field is to see more female faces on construction sites and in engineering in general. She would also like to see more properly fitting personal protection equipment available for females.



*Browren's advice for your women is **don't be afraid to step out of your comfort zone.** You may be the only woman in the room, but that's okay. Don't be afraid to ask questions. Everything you do and every job that you have you can learn something from it. All experiences make you interesting and memorable.*

Civil Engineer



Maggie MacKay

*Water Resource Engineer
Klohn, Crippen Berger (KCB)*

Maggie is a Water Resource Engineer specializing in dam safety and mining. Her work ranges from analyzing problems, to project management and developing solutions to reduce dam safety risks.

Career/Educational Path

What led Maggie to her career in engineering was her exposure to engineering from a very young age. Maggie's mother and father were both engineers, along with several other family members, which was a huge influence on her decision.

Maggie completed her undergraduate degree in Civil Engineering and specialized in water resources. She graduated during a recession so there were not many jobs and therefore decided to do her Masters of Applied Science in Civil Engineering. Maggie noted that the market is different now and there are a lot of positions available.

Maggie grew up and attended high school in Bedford, Nova Scotia, but did her undergraduate and master's degrees in Ontario.

On a typical day Maggie works on projects that can last from a few weeks to a few months. There is some field work, but a lot of data is collected remotely, using aircraft LIDAR technology. She does site visits to get an idea of what important structures she should be aware of and to understand the condition of the dam and spillways.



In addition to the field work, there is a lot of computer analysis, which she likes. She spends a lot of time looking at maps, including flood mapping and topographic mapping. Communication is an important part of her daily work. She attends a lot of team and project meetings, and technical report writing is one of the most important parts of her job.



There is a lot of opportunity to be in the field, including international travel.

Maggie spent six months in Panama working on a large copper mining project that included construction water management, road drainage design and sourcing fresh water supply. She has also worked in gold, nickel, zinc, asbestos and coal mining.

Qualities and Skills

Qualities and skills that are a good fit for a career as a Water Resource Engineer are independence, problem solving, and being a team player. Social skills and being a people person definitely helps. Having a good foundation in science and math is also key. If you don't take math and science throughout high school, you can't go into engineering. However, even if science and math aren't your best subjects, being dedicated and a hard worker can help you get through the engineering program.

Maggie would describe herself as analytical and is more of an introvert than an extrovert. She likes solving problems, researching, likes processes and is a rule follower.

What
is **airplane LiDAR**
technology?

LiDAR works in a similar way to Radar and Sonar yet uses light waves from a laser, instead of radio or sound waves. A LiDAR system calculates how long it takes for the light to hit an object or surface and reflect back to the scanner. The distance is then calculated using the velocity of light.

Career Highlight:

Maggie's **most interesting** and enjoyable project so far was the copper mine project she worked on in Panama. The project lasted two years, including six months in the field. The client wanted to reduce impacts to the environment and to public safety. Site specific research and cutting edge technologies were applied throughout the project. Being in a country that is exotic and different was also a perk! She worked with an extremely diverse team that spoke many languages, including Spanish, English, and French.

Maggie worked closely with the environment group to develop ways to treat contaminated water to reduce environmental impacts from the construction of activities.

During construction, soil can become exposed and may erode, then end up in the water that can flow into the natural environment. High concentration of sediment in the water that discharges into a fish bearing stream could impact the fish because the sediment can clog their gills. This could be detrimental to the receiving fish population.

Maggie's **favorite part** of her job is the actual data analysis and problem solving. She also likes working with a team and working with different personalities. She said "you can always find someone on your team that you can learn from". That's why she is working specifically with her company, as she loves learning from the people on her team. "It has been fantastic". She feels like you never stop learning and you never stop dealing with different types of problems.

According to Maggie, one thing that **surprised her about her career**, was how long people stay in the industry – and still stay sharp. Engineers in her field are passionate about dams and public safety. Clients value the knowledge and experience of engineers in their industry and therefore they tend to stay in the industry longer than most engineers.

Maggie also realized while on maternity leave that she needs to be solving problems and working with a technical team to feel balanced in her life.

Career Impact

Through her work as a Water Resource Engineer, Maggie helps society and communities in two primary ways. First, her work on dams is directly related to protecting the public and the environment by understanding, reducing and managing dam safety risks. Secondly, in her work on mines, she is helping reduce environmental impacts of contaminated water by managing and treating it before being released to the environment.



Maggie's **vision or dream** for women in her field is her hope that there are a lot more females in the industry, as she likes working with diverse teams. Women in engineering tend to have more social awareness and see problems from a different perspective than men. She hopes that a balanced number of female engineers will become the new normal.

Engineering is a diverse industry, and you may not think you are a perfect fit based on your own qualities, but the more diversity we have in our teams, the better our solutions will be.

Maggie's program of study in Civil Engineering helped benefit her career as you can't get an engineering job without it. Also, she admits that having a master's degree was also a benefit, as her employer recognized that she had gained the skills required to work and problem solve independently than just being out of an undergraduate degree.

Maggie's advice for females wanting to pursue a career in environmental engineering is to stay in Science and Math; embrace your differences, because this will give you a unique problem solving perspective that helps teams develop some of the best possible solutions. Maggie also said, "don't be afraid to speak up if you have a different perspective or opinion".

Civil Engineer (Project Management)



Nathalie Vendrys
Project Consultant

Nathalie is a Civil Engineer and her title is Consultant in Continuous Improvement, Process Optimization Business Re-engineering.

Career/Educational Path

What led Nathalie to her career as an engineer was her desire to do something practical, useful and to make a difference while also having an exciting career. She wanted a career that would offer diversity so she wouldn't get bored and one that would open many doors and evolve over time. She wanted the flexibility of doing something over and over again, but not in the same context and she wanted to always be learning and have an impact on the world.

Nathalie grew up in Montreal, Quebec in a Greek community where she attended high school and college. Nathalie learned about engineering from a personality test she took in school. The year she started university was the year of the senseless killing of female engineering students at École Polytechnique University and it had a huge impact on her. She felt like she had a responsibility as a woman to follow the engineering path and help prevent it happening again. This is the source of her passion and said it was a turning point.

Nathalie did a five-year undergrad in Sherbrooke, Quebec with four, six-month co-op work terms, one of which led her to an internship in Guadeloupe in the southern Caribbean (building an airport). There, she realized she could work in another country, have fun, and do it without knowing anyone. Later, Nathalie became certified in Project Management, as well as taking numerous other courses. Nathalie also has a degree in Osteopathy.

On a typical day, Nathalie works with small and medium companies, or municipalities to help improve their way of creating their products or delivering services. Nathalie's first task as a consultant is to meet with management to understand their business, their mission, vision, goals, challenges, history, what's important to them and what's irritating them. She then asks them to prioritize the challenges. She talks to subject matter experts to understand their processes, who is involved, and the culture in the workplace. She conducts surveys to help figure out the problem, as well as looking at the technology and human aspect. She has to constantly communicate, update management and employees on the status of the project, create documentation, conduct brain-storming sessions, write reports, and cultivate employee engagement.



Qualities and Skills

Nathalie describes herself as passionate, analytical, logical, optimistic, positive, methodical, but also flexible. She always has a plan, but says you need to be willing to change or to make an immediate decision. She said “the first thing you need to work on is yourself. How are you going to show up? Do your homework, learn, be humble and go get it”.

Qualities and skills that are a good fit for a career as a project manager include being organized, disciplined, focused, logical, problem solver, detailed, action-oriented, creative, self-motivated, curious, and the desire to make a difference no matter how complicated. Also, the ability to look at complex things, simplify them and communicate it so that everyone understands.

Nathalie says it's important to bring diversity into the Engineering profession. She said there has been a shift but we need to go further. She says we need more visibility and need to see diverse images of women to be the face of society. She said “we need to dismantle prejudice and cultural limitations by providing role models and examples of how it can be”.

Career Highlight:

Nathalie's most **enjoyable project** was in Guadeloupe where she worked on adding an extension to an existing college while it was still operating as a college. She was in charge of the whole project. She said it was a tough challenge, but it shaped her a lot and she wanted to make an impression that she could succeed. While working there, she liked to influence the young kids who were near the construction field so that they could see a female doing a mainly male role at that time. She said if she could inspire at least one girl to do something out of the box it was worth it.

Nathalie says to consider choosing a field that aligns with what you like today, but also something that has variety and can open many doors once you know yourself better and what you may want. That way, if you change along the way you aren't stuck.

Nathalie's **favorite part of her job** is meeting with a group of people, working through a process, helping solve their problems, and getting the issues into a state of order. Involving others empowers them to make the necessary changes.

What **surprised** Nathalie about her career was how diverse the projects can be. She has worked on roads and bridges, learned about urbanism, marketing, and finance. She said "she never gets bored".

Another **surprise** for Nathalie was the perception that engineering is very technical, which it is if you are a design engineer, but there are many parts of engineering that involve people, so good communication skills are key to being able to express yourself clearly and make it simple for others to understand.



Career Impact

Through her work as a civil engineer, Nathalie helps society and communities by answering a need, easing a process, creating a new tool, providing something to ease people's lives and make life better. For example, engineers protect the environment by designing solar cars, planes, building better roads, etc.

Nathalie's program of study in Civil Engineering helped benefit her career as it gave her structure, methodology, and the tools to solve problems, how to ask useful questions, critical thinking skills and the ability to ask why.

Nathalie's **vision or dream** for women in her field is to have equal representation of every type of woman and everyone to be accepted and valued for what they can contribute.

She wants women to have more visibility and to be inspired so that we can have more female ambassadors.

Nathalie's advice for young females is to have a bigger purpose, do what lights you up and be clear about it. It may not always be easy along the way, but find the motivation that will keep you going.

Work on yourself, believe in your skills and love what you do. When you know yourself and respect yourself, you get to choose what is appealing to you.

Don't try to fit into what society thinks, i.e. getting a status or doing it for the money. Buy into your mission and show up with everything you got! When you light up, you are in line with your values and you have a clear mission and know why you are doing it.

Since the interview, Nathalie switched roles and is working with a non-profit organization called STEAM PEI to deliver practical and fun experiences to kids (in and out of schools) around Science, Technology, Engineering, Arts and Maths. She is in charge of the development and delivery of the French program and aims to reach girls, indigenous kids and rural communities from 5 to 16 years old.

Questions to Ask Yourself Before Deciding on a Career

- What do you like to do in your spare time?
- What energizes you?
- What kind of environment would you like to work in? (ex. office, outdoors, a lab, etc.)
- What do you want to wear to work?
- How often do you want to change projects?
- What sorts of hours do you want to work?
- Do you want to travel?
- Would you like to work independently, or as part of a team?

Interested in a particular career? Ask a trusted adult if they know anyone who could talk to you about it.



Questions to ask a Role Model

- What attracted you to this field?
- What do you like most or least about this position or field?
- Describe a typical day or week?
- What steps did you take to break into this field?
- What skills are most helpful in your job? How can I develop them?
- To what professional associations do you belong?
- What advice would you give somebody interested in your line of work?

Useful Resources

- Wiseatlantic.ca - Mentor Videos; Posters, etc.
- Yourfreecareertest.com
- <https://exploreengineering.ca/discover-engineering>
- Skills Canada - www.skillsns.ca
- www.Techsploration.ca
- www.webtools.ncsu.edu/learningstyles/
- vark-learn.com (Questionnaire for Teens)
- www.univcan.ca/ (links to all of Canada's universities and colleges, accompanied by useful facts and statistics, as well as a searchable database of study programs)
- cybermentor.ca (mentor stories)
- nscareeroptions.ca
- <http://www.discovere.org/discover-engineering/engineering-careers>

Engineering Career Competencies

Competencies are the knowledge, skills and attributes you can develop in every aspect of your life.

- Analytical
- Inquisitive
- Problem Solver
- Logical
- Observant
- Collaborative
- Persistent
- Organized
- Independent
- Creative
- Effective Communicator
- Planner
- Team Player

Doodle Page for You

Brainstorm images or words that you associate with your future.

About WISEatlantic

The Women in Science and Engineering - Atlantic Region (WISEatlantic) program aims to shift gendered STEM stereotypes. We empower girls to consider Science, Technology, Engineering and Math (STEM)-based careers by raising their awareness of the diversity of jobs within these fields, and enabling them to visualize themselves working in these fields. WISEatlantic also supports early career women in STEM through professional development and networking opportunities.



www.WISEatlantic.ca

For up-to-date information on events, resources and articles of interest, connect with us!



@WISEatlantic