

Introducing NGen's

Careers of the Future

How to Introduce Your Students
to Advanced Manufacturing

Who is NGen?

Next Generation Manufacturing Canada - NGen for short - is a not-for-profit organization that leads Canada's Advanced Manufacturing Supercluster. We aim to help promote Canada's strengths in advanced manufacturing at home and around the world, connect and build collaboration in support of advanced manufacturing across Canada, support collaborative projects in leading technology applications in manufacturing, help small companies adopt technology and scale up, and develop the advanced manufacturing workforce of the future.

What is a supercluster?

Canada's superclusters are areas of intense business activity made up of companies, academic institutions and not-for-profit organizations that boost innovation and growth in a particular industry. Canada's Advanced Manufacturing Supercluster was founded on the principle that advanced manufacturing will enrich the lives of all Canadians, deliver better products and good jobs, and generate economic growth essential to building a better world.



About



Careers of the Future is an initiative led by NGen on behalf of Canada's advanced manufacturing Supercluster. The initiative is meant to educate young Canadians on the advanced manufacturing sector, showcase the limitless career opportunities within advanced manufacturing and how they can kick-start their career journey today. Careers of the Future is made possible through funding from the Government of Canada's Innovation Superclusters Initiative and contributions from NGen members.

More Resources and Information →

To learn more about NGen and Canada's advanced manufacturing supercluster, visit ngen.ca

For more information about the Careers of the Future initiative, visit careersofthefuture.ca

Advanced Manufacturing in Canada

What is advanced manufacturing?

Advanced manufacturing combines science and technology with manufacturing capabilities to improve how we make things, leading to new and better products that are unique, smart, cleaner, and often autonomous. Advanced manufacturing enterprises don't just assemble or make things; they use cutting edge technologies, business and engineering know-how, software, data analytics, and artificial intelligence to solve problems - and address some of the world's most pressing challenges. Some of the industries that are at the forefront of advanced manufacturing in Canada include biomanufacturing and medical technologies, clean and autonomous vehicles, aerospace, robotics and automation, agrifood and agricultural equipment, textiles, electronics, 3D printing, and more. Why is advanced manufacturing important? Because it builds things better, safer, cleaner, and more productively for a better world.

What is the impact of advanced manufacturing in Canada?

Advanced digital, materials, and production technologies and next-generation manufacturing capabilities are revolutionizing how products and components are designed, manufactured, distributed, used, and recycled across a spectrum of industries. Developments in robotics, automation and technologies such as machine learning and additive manufacturing (3D printing), have far-reaching application in Canada's economy, including aerospace and defense, automotive, agriculture and pharmaceuticals. Canadian innovators are producing a diverse range of technologically complex, high-value products for domestic and competitive global markets.

What do careers in advanced manufacturing look like?

Traditionally, when you think of Manufacturing, an old-school image comes to mind: workers in overalls and work boots standing around a conveyor belt in a steely, warehouse, factory type environment. However, that is an image of the past. Today advanced manufacturing is clean, safe, highly automated, and begging for young people with the creativity and problem-solving capabilities to make things better. While a majority of careers require STEM based courses and experiences, there are several career paths one can take while trying to get into the industry. The more tactical, hands on careers of advanced manufacturing can include building, designing and creating technologies, machines, computers and other technological innovations, such as robotics and artificial intelligence. On the scientific side, you may have the chance to develop cleantech and clean energies, as well as developing new medical products such as vaccines and more. However, as previously mentioned, advanced manufacturing can really incorporate many more types of work within the industry: art and design, marketing and communications, writing, publishing and editing. Contrary to popular belief, advanced manufacturing is not just machines and conveyor belts. It requires a dedicated group of working individuals to develop, create, execute and deploy the multitude of products that are manufactured within the industry. It's about ideas and creativity, technique and ingenuity, how technologies are used to make customized things, that will create the career opportunities of the future. No matter a student's skills, interests, passions or strengths, there is an opportunity waiting for them within advanced manufacturing.

What schools offer advanced manufacturing courses? →

For further information on the programs offered by these institutions, [visit our resources page.](#)



Information for Parents

Parents are bound to have questions about advanced manufacturing as a potential career path for their children. Here are some tips to help you answer them and facilitate their discussions at home.

Why should my child consider a career in advanced manufacturing?

Advanced manufacturing has the potential to provide your child with an exciting, life-long career in a path of their choosing, where they can truly help make a difference in the world. The sector offers an impressive diversity of jobs, many of which don't require skills in STEM. Opportunities exist in design, research, marketing, digital development, and growing/launching companies, all of which contribute to building a bright future for advanced manufacturing in Canada. These jobs are constantly evolving, requiring people to learn new skills and consider new ideas, while helping to make the world a better place. Parents will also be pleased to know that working in the sector is safe, secure, well-paying, and fulfilling.

How can my child get into advanced manufacturing?

There are many ways to pursue a career in advanced manufacturing. A majority of post-secondary institutions across Canada offer a wide selection of related courses, including specialized technological learning and more generalized education. Many of these institutions provide real-life, hands-on training to help further prepare students for working in the industry. Advanced manufacturing will require students to have the required grades that fall within STEM based courses. Science, Technology, Engineering and Math. The sector offers a diversity of jobs, many of which don't require STEM skills. Opportunities exist in design, research, marketing, digital development and growing/launching companies which all contribute to building an amazing future for advanced manufacturing in Canada.



To learn more about post-secondary schools offering programs and courses related to advanced manufacturing, as well as the programs most suited to your child's interests, visit careersofthefuture.ca/resources



Students and their parents can learn more about exploring a career in advanced manufacturing at careersofthefuture.ca

Classroom Resources

Use these resources to guide your classroom discussions about advanced manufacturing, the role it plays in shaping the future, and the type of the careers that exist within the field. Find more information to support your lessons at careersofthefuture.ca

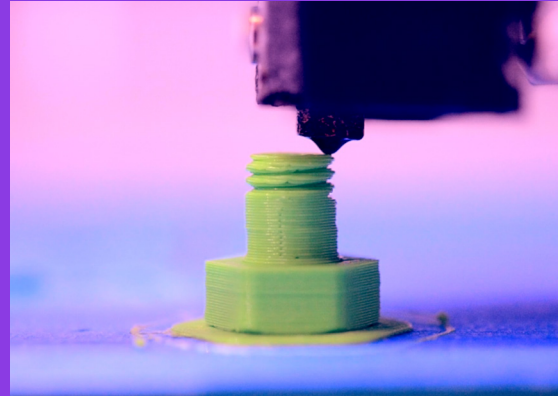
Why should students learn about careers in advanced manufacturing?

When you integrate new technology into manufacturing, the potential to help people and solve problems is limitless. That's what makes a career in advanced manufacturing so fulfilling.

New technologies like 3D printing, AI and robotics are improving how we make things, and inspiring new products and industries by:

- Delivering product and process innovation toward clean, sustainable, flexible manufacturing
- Solving productivity, health & safety, and sustainability challenges
- Building future supply chains
- Evolving agricultural production
- Solving global challenges like how to meet energy demands through marine renewable energy, fisheries, aquaculture, oil & gas, defence, shipbuilding, and transportation

The sector offers a wide range of career options, many of which don't require highly technical skills. Opportunities exist in accounting, marketing, sales, and human resources, which all contribute to building a bright future for advanced manufacturing in Canada. These jobs are constantly evolving, requiring people to learn new skills and consider new ideas, while helping to make the world a better place. You can choose a path in medical, healthcare, sports, education, energy, transportation, agriculture, and fishing, to name a few.



Fun Facts

Advanced manufacturing is responsible for some of the world's greatest inventions and plays a big role in our everyday lives. From the Canadarm to our smart phones, advanced manufacturing is propelling us into the future.

Study Aid

Tune into our **study aid** on YouTube of satisfying advanced manufacturing processes filmed at the Humber Barret Centre of Technology in Ontario. The video is one continuous soothing loop that transports viewers into advanced manufacturing that can also be used as a study aid.

Glossary of Terms

There's a lot to learn when it comes to advanced manufacturing. Brush up on all the important terms you need to know at manufacturing.gov/glossary.

Case Study

Advanced manufacturing has the potential to provide your child with an exciting, life-long career in a path of their choosing, where they can truly help make a difference in the world. The sector offers an impressive diversity of jobs, many of which don't require skills in STEM. Opportunities exist in design, research, marketing, digital development, and growing/launching companies, all of which contribute to building a bright future for advanced manufacturing in Canada. These jobs are constantly evolving, requiring people to learn new skills and consider new ideas, while helping to make the world a better place. Parents will also be pleased to know that working in the sector is safe, secure, well-paying, and fulfilling.



Areas of Study

Explore the different and fascinating careers of advanced manufacturing along with programs available across the country. Students can learn about the pathways to specific careers and which ones align most with their interest and passions.

Student Contest



NGen is challenging youth across Canada to co-create the future they want, through a career in advanced manufacturing. We're giving students a chance to win a \$10,000 bursary toward their post-secondary education.

To enter, students are asked to submit an essay of 500 words or less (English or French) on the following topic: What problem do you think advanced manufacturing could solve in the future? And, what role would you like to play in making it happen?

The contest runs from May 13 to June 2 2021, and is open to all students aged 15 to 18.

For more details and to enter the contest, visit CareersoftheFuture.ca/contest

Traditional Manufacturing, Advanced Manufacturing and STEM

Traditional Manufacturing

Traditional Manufacturing

Converts raw materials into ready-to-sell products using manual and/or mechanized transformational techniques.



CARS



STEEL



CLOTHING



STEM (Science, Technology, Engineering + Math)

STEM

Integrates Science, Technology, Engineering and Math into a single, cross-disciplinary program with real-world applications.



DATA & ANALYTICS



COMPUTER PROGRAMMING



ENGINEERING



Advanced Manufacturing

Marries traditional manufacturing and STEM to develop advanced techniques and equipment that helps create better products and improve efficiencies in industries like transportation and healthcare.



SELF-DRIVING CARS



WEARABLE TECHNOLOGY



ROBOTS

More Learning Opportunities



Would you like more in-depth, hands-on classroom activities to supplement your advanced manufacturing lessons? If you'd like us to contact you when new activities become available, please send your name, school, subject and grade cohort to careersofthefuture@ngen.ca

CAREERS OF THE FUTURE .CA

Terms and Conditions | Manufacturing the Future Contest

No purchase required. Contest begins on May 13, 2021 at 12:01 a.m. EST and ends on June 2, 2021 at 11:59 p.m. EST. There are a total of ten (10) bursary prizes of \$10,000 each available to be won to be used for post-secondary education costs in Canada. Open to legal residents of Canada who are between the ages of 15-18 at the time of entry into this Contest and planning to enter post-secondary education within 24 months of entering this Contest. Odds of winning depend on number of eligible entries received before contest closes and entrants' skill meeting the entry criteria. Entrants must also answer an essay question on the topic of "what problem do you think advanced manufacturing could solve in the future? And, what role would you like to play in making it happen?" For full rules and entry details visit: www.careersofthefuture.ca.