JULY 2021

CAREERS SERVICE

Careers Occupational Information Unit

Bulletin

ADVANCED MANUFACTURING IN NORTHERN IRELAND

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- Video/article insights into careers in the sector
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Welcome

This bulletin, published by the DfE Careers Occupational Information Unit (COIU), focuses on careers in the Advanced Manufacturing sector in Northern Ireland. Through video clips and interview articles, it shares insights from the perspectives of those who work and study in the local Advanced Manufacturing sector, as well as those who teach and support local students of Advanced Manufacturing disciplines.

The bulletin provides information on entry routes into the sector, as well as useful resources for further research.

Why is the local Advanced Manufacturing sector so important?

In the Department for the Economy's medium-term economic recovery plan, Rebuilding a stronger economy, four sectors were identified as key to rebuilding Northern Ireland's economy.

The Advanced Manufacturing sector was one of the four sectors highlighted, and covers automotive, construction, materials handling, electronics, consumer products, water, and aerospace and defence. The importance and potential of Advanced Manufacturing, has been noted - it is an area in which NI is already a global leader and is recognised for its strengths in regards to: plastics and polymers, composites design and manufacturing, precision manufacturing and specialist joinery and fit-out.

Additionally, the Department for the Economy's **10X Economic Vision** identified Advanced Manufacturing as one of five priority clusters, with significant capability and capacity and the potential to drive the economy forward, providing more, higher paid jobs within the next decade.

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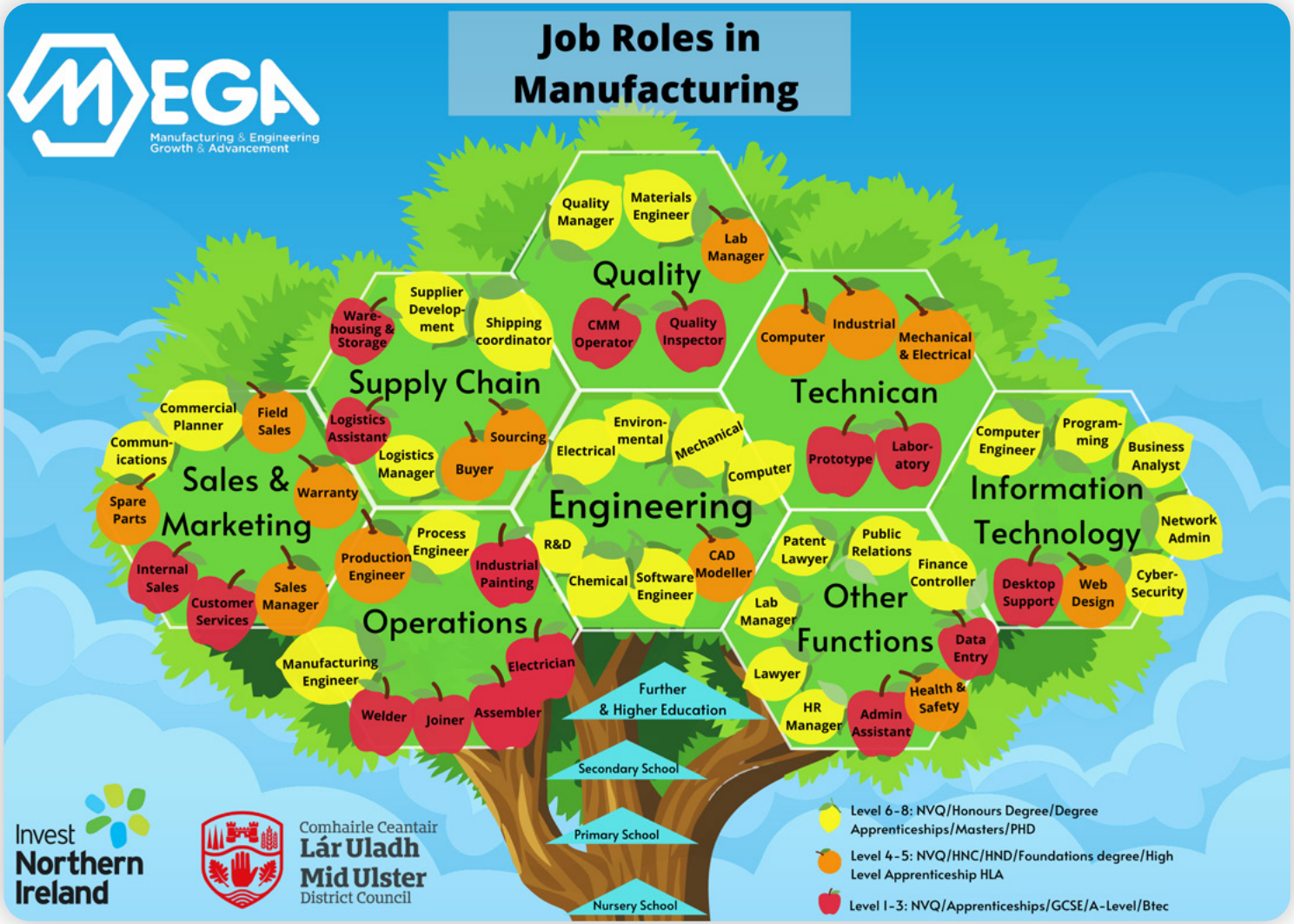
Careers in Manufacturing

There is a huge variety of job roles available in the Manufacturing sector, from Engineering and technician roles, to IT; quality, supply chain; operations; sales and marketing, as well as other business support roles, as the infographic produced by MEGA (Manufacturing and Engineering Growth and Advancement) shows:

To find out more about the broad range of career opportunities available within Manufacturing, check out MEGA's videos featuring local people working in the sector.



The Northern Ireland AMME Careers Landscape

The following infographic below illustrates the current and future landscape of AMME careers sector in NI:

THERE ARE OVER **47,000** WORKERS IN ADVANCED MANUFACTURING SECTOR

OVER THE YEAR TO APRIL 2021, THERE HAVE BEEN **1,466 JOB POSTINGS** FOR THE ADVANCED MANUFACTURING SECTOR IN **NORTHERN IRELAND.**

58% OF JOBS IN THE SECTOR REQUIRE A DEGREE.

MEDIAN SALARY OF **AROUND £29K P.A.**

27% OF THE JOB POSTING IN ADVANCED MANUFACTURING REQUIRE THE QUALIFICATIONS OF EITHER STANDARD **GCSE GRADES OR A LEVEL 2 NATIONAL VOCATIONAL QUALIFICATION** OR BELOW.

OVER 150 COMPANIES IN THE PAST YEAR ARE ACTIVELY RECRUITING IN ADVANCED MANUFACTURING **SECTOR**

THE COMPANIES THAT ARE HIRING MOST FROM THIS INDUSTRY ARE **THE RANDOX LABORATORIES, SENSATA TECHNOLOGIES LIMITED AND TEREX GB LIMITED.**

THE SKILLS DEMANDED INCLUDE **ENGINEERING DRAWINGS, WELDING** AND **TEAMWORK/ COLLABORATION**

Sources: NISRA – NI Labour Force Survey – Quarterly Employment Survey (employment numbers); NISRA (ASHE) Annual Survey of Household Earnings (wage data); Burning Glass Technologies: Labor Insight ™ 2020.

Mary Meehan - Manufacturing NI

Mary Meehan
Deputy CEO,
Manufacturing NI

5 Reasons why it's great to work in Advanced Manufacturing in Northern Ireland.

Northern Ireland has a world-class reputation in advanced manufacturing materials and engineering (AMME) and this will be key to rebuilding the economy after the impact of Covid-19, delivering higher paying jobs, a highly skilled workforce and a more regionally balanced economy.

Here are some reasons why you should consider a career in Advanced Manufacturing:

1. Contribution to The Northern Ireland Economy

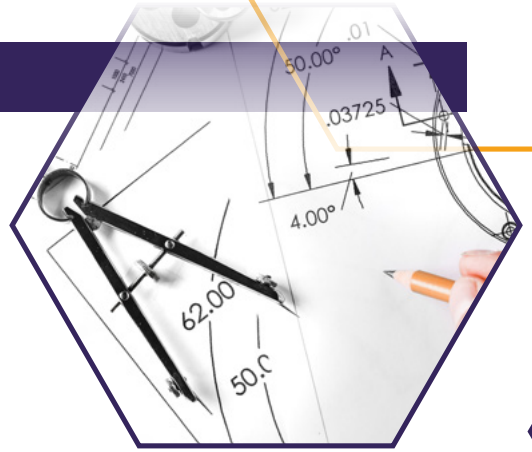
Northern Ireland has a strong cohort of around 2,200 advanced manufacturing, materials and engineering (AMME) companies.

These companies employ over 46,000 people and are worth approximately £3.2 billion to the local economy, accounting for around 8% of our economic output. AMME was one of the biggest exporters in 2019.

2. Working smarter with cutting edge technology

Jobs in advanced manufacturing are often highly skilled, well paid and responsible for cutting-edge research and development.

Today new technologies like IoT, data analytics, automation and 3D printing present exciting opportunities to be ahead of the curve and to leap start your career in technical and digital technology.



One of the great benefits of working in the AMME industry is the fact that you are often working on real, tangible products. Manufacturing affects almost everything in our lives - just look at how the sector stepped up to the challenge during the pandemic – pivoting their operations to make sanitiser, face masks using 3D printers and ventilators.

Mary Meehan Deputy CEO, Manufacturing NI (continued)

3. New job opportunities

There have been some difficult times for the manufacturing industry in recent months with redundancies announced at some companies due to the impact of Covid. However, in the face of recent disruptions, namely Brexit and COVID, many companies are likely to bring manufacturing production and sourcing back to Northern Ireland. It is estimated that the sector is expected to require at least 1,500 new workers every year, with opportunities across all skills levels and work which includes R&D, new product development and manufacturing.

Recent technical skills required by job applicants included welding; engineering drawing; Mig and Tig Welding; as well as softer skills such as teamwork/ collaboration; customer service; and scheduling.

In addition, gender diversity is increasing in the sector and lots of great work has been completed by Manufacturing NI in raising the profile of women in manufacturing working closely with other bodies such as;-

- **Matrix**(Northern Ireland's science industry panel) and;
- **WISE**, a UK body committed to encouraging women and girls to take up careers in sci-ence and engineering, to develop a Northern Ireland regional hub aimed at showing girls that STEM careers are exciting, well-paid and fulfilling.

4. Better places to work

Manufacturers are hugely committed and loyal to their workforce and to the communities in which they are located, getting involved in sponsorship of local sports teams, participating in charity events and closer school engagement.

Increasingly manufacturers are offering more generous packages including health plans and health and wellness programmes for employees as well as offering flexible working practices.

Workers are the biggest assets in the evolving manufacturing industry and today's employees expect contemporary work environments and to be managed differently than they were in the modern era of manufacturing that began in the 1920s. While many unfortunately still have a negative perception about the industry, the development of new technologies is at the fore-front ensuring safety in the workplace, as machines are assuming some of the more dangerous tasks that have previously been executed by people.

During Covid many workplaces have put in place the most stringent health and safety measures and completed rigorous risk assessments to ensure a safe and healthy working environment.

5. Career progression

Within the sector, there are plenty of options for your career path - from fabrication and welding to research and distribution, to computer software and accountancy. Leadership opportunities will always be available and in fact many of the CEOs in today's manufacturers started their life as an apprentice and worked their way up through the organisation.

Manufacturing jobs offer a wide variety of entry level positions. Most companies offer on-site job training, which is perfect for recent graduates or those looking for a complete change from their day-to-day, so there is always room to grow and advance your career.

Advanced Manufacturing - Student Snapshots

The short profiles below feature local students and apprentices from a range of Advanced Manufacturing disciplines.

Here, they share their experiences of learning and working locally, and offer their advice to those considering a career in the Advanced Manufacturing sector.

JORDAN ANDERSON

Engineering Foundation Degree student at SWC

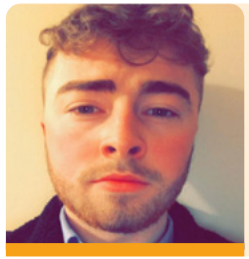
Currently studying: Foundation Degree in Engineering at South West College (SWC) Omagh.

Educational path: GCSEs at school, followed by BTEC Level 3 Extended Diploma in Engineering at SWC.

What's next: Aiming to do Master's Degree in Engineering.

Jordan says: If you don't feel like going to university now then the Foundation Degree in Engineering could be for you. I have found that it's not that much different from the BTEC in how the subjects are delivered, only that you go deeper into subjects and learn more in-depth about them.

"Really work hard and try to develop a good understanding of each individual subject. If you work hard during your BTEC L3 course, then the Foundation Degree will be that bit easier for you to progress onto".



Shane McAloon

Mechatronic Engineering MEng student at Ulster University

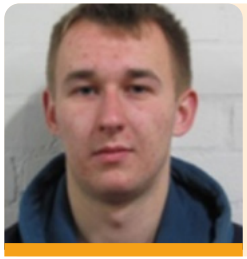
Currently Studying: Master's Degree in Mechatronic Engineering at Ulster University

Educational Path: GCSEs at school, BTEC Level 3 Extended Diploma in Engineering at SWC Enniskillen, Foundation Degree in Mechatronic Engineering at SWC Omagh

Shane says: I had to complete a 3-month placement as part of the Foundation Degree, and I worked at Combilift, a forklift manufacturer in County Monaghan. I still work with this company when I can, further developing my Engineering skills.

The variety of modules I studied at SWC gave me broad insight into the different aspects of engineering. I really enjoyed PLC programming and electronics in the foundation degree and the knowledge from these subjects really helped when I went to university. Even though I found going in to second year at UU quite a bit of a jump, the knowledge from the Foundation Degree really helped me. Initially I was only going to complete my Bachelor's degree but after an overall grade of 74 (1:1) from second year I decided to move to the German Master's course, which means I come out with a German Masters and Ulster University Masters in Mechatronic Engineering next June 2021.

"Aim as high as you can and strive to become the best you can be. You don't have to be a genius to study engineering, you just have to put the effort in. The opportunities in engineering are huge".



KYLE WILSON

Welder/pipe fitter and former Fabrication and Welding student at NWRC

Current Employment: Working as welder and pipe fitter with Gallagher & McKinney Ltd, a specialist engineering company delivering project management and installation of piping solutions into industry.

Previous Employment: Working for Crossland Tankers Ltd while completing four year welding and fabrication apprenticeship via the Apprentice NI scheme, whilst attending North West Regional College on day release.

Educational Path: Various City and Guilds, and BTEC qualifications in Engineering/Fabrication and Welding at North West Regional College (NWRC).

"During my time at NWRC, I was selected to represent the college at the Inter-College Skills & UK Apprentice Welding & Fabrication competitions.

I was also very fortunate to be selected to participate in an apprentice exchange with a technical college in Germany".

VYGINTA ASTRAUSKAITE

Higher Level Engineering Apprentice, SRC

Current Employment: On placement as a Higher Level Apprentice with Thompson Aero Seating

Educational Path: BTEC Level 3 Extended Diploma in Engineering at Southern Regional College, Portadown, and currently completing a Higher Level Apprenticeship in Engineering.

Vyginta says: In order to begin your career in any field of Engineering, University isn't the only route to success. Engineering in particular, not only relies on application of educational knowledge, but real life application of problem solving and logical thinking which a lot of higher education courses don't provide. The HLA is a fantastic choice as the course covers a wide range of mechanical and electrical engineering related subjects which can then be selected to study further at university level along with industry experience.

My placement company Thompson Aero Seating is providing outstanding training and further support in gaining course related experience in areas such as CAD, CNC, engineering materials, etc.

"Don't feel discouraged by the lack of gender diversity. I'd strongly advise you to step out of your comfort zone and look into the wide range of opportunities available in Engineering".

ANNA DELARGY

Mechanical and Manufacturing Engineering Higher Level Apprentice, NRC

Currently employment: Higher Level Apprentice with AGR Automation while studying final year of Foundation Degree in Mechanical and Manufacturing Engineering at Northern Regional College (NRC).

Educational path: Level 3 Extended Diploma in Electrical and Manufacturing Engineering at NRC.

What's next: Completing Foundation Degree and progressing to finishing full degree through Open University.

Anna's Advice: "If you have a passion for engineering, follow it and strive to be the best you can be."

"Everything I look at, I wonder how it works or how it was made, and I feel that is an absolute passion for engineering, and having that mindset definitely helps when you are working in an engineering environment".

JOHN IRWIN

Mechanical and Manufacturing Engineering Apprentice, NRC

Current employment: Working firstly as a shift operator, then promotion to Shift Operations Technician, with Bouygues Energy and Services, while studying for Foundation Degree in Mechanical and Manufacturing Engineering on day release to Northern Regional College

Educational path: A Levels, followed by an apprenticeship with AES Kilroot and Ballylumford Power Stations, the first year of which was full time study at Northern Regional College for a BTEC Level 2 in Engineering (Specialist Manufacturing Engineering) alongside an NVQ Level 2 in Performing Engineering Operations. The BTEC qualification gave me the theoretical knowledge whilst the NVQ gave me a range of mechanical and electrical skills.

John's advice for students studying engineering: Look to the long term benefits of studying when it gets difficult in the short term. The opportunities that opened up through studying for myself have been endless. **As well as the content of the courses that I have studied, the willingness to study of your own accord gives a good impression to your current/future employer's opinion of you and sets you apart from others.**

"On completion of my Foundation Degree I will be qualified to apply for a Shift Team Leader post. I would also like to specialize in Health and Safety and complete the Institution of Occupational Health and Safety (IOSH) and National Examination Board in Occupational Safety and Health (NEBOSH) qualifications".

Eoghan Gormley – HNC Aeronautical Engineering student, BMC

Educational path: A Levels, leading to studying HNC in Aeronautical Engineering at Belfast Metropolitan College (BMC)

What's next: I plan to go university next year to study mechanical engineering, not because I don't like the aeronautical aspect but purely the fact I believe it is a more varied degree and it will be easier to find a job in the future which is the end goal.

Eoghan's advice for students studying engineering: My engineering work experience at Seagate helped me gain entry to the HNC course at BMC

"I believe that the practical and experimental part of the HNC course is beneficial as it will help kinaesthetic learners like myself to help visualise information, making it easier to listen and learn."

Caoimhín McGowan – HNC Aeronautical Engineering student, BMC

Current study: HNC in Aeronautical Engineering at BMC

Previous experience: Welding/pipe fitting Apprenticeship with AE Global, Level 2 in Welding and Fabrication, Level 3 Subsidiary Diploma in Engineering

What's next: **I intend to go to university to study Aerospace Engineering, then potentially going on to complete a masters in astronautical engineering. Another option I am considering is to go on to complete a higher level apprenticeship in a related field. The HNC benefits me for both of these plans as I will have the knowledge, experience, and qualification to follow through.**

Caoimhín says: In the HNC course, I did not anticipate for it to be so heavily focused on practical elements of this subject. I find this very beneficial as I personally find this is the easiest way to learn. I think this will be of great help in the future when I go on to have a career in this field as I will have the experience required to carry out activities such as the ones we learn in this course.

"I intend to go to university to study Aerospace Engineering, then potentially going on to complete a masters in astronautical engineering. Another option I am considering is to go on to complete a higher level apprenticeship in a related field. The HNC benefits me for both of these plans as I will have the knowledge, experience, and qualification to follow through."

HANNAH DUNWOODY

Higher Level Apprentice – Mechatronics, South Eastern Regional College (SERC)

Currently studying: Higher-Level Apprenticeship in Mechatronics (Year 2) South Eastern Regional College.

Educational path: GCSEs at Grammar School before joining SERC to complete a Level 3 Extended Diploma in Engineering

Hannah says: "You go to school, college and university to learn with the ultimate goal of employment – I've just got there a little faster through the HLA in Mechatronics."

I'm continuing my education at SERC, learning while I'm earning at Lowden Guitars, plus I will have three years' work experience under my belt by the time I'm finished the Higher Level Apprenticeship.

ADAM SMYTH

Level 2 Engineering Apprentice at South Eastern Regional College (SERC)

Current studying: Engineering - Apprenticeship NI (Level 2) South Eastern Regional College.

Educational path: GCSEs at school before joining SERC.

Adam says: "In my job with NI Engineering, I am using specialist CNC lathes to in create high pressure valves.

I highly rate my overall experience. It is important that you keep up with the coursework but there is lots of support and encouragement to help you progress in your Apprenticeship."

"I am really enjoying my Apprenticeship and being in work. I am particularly enjoying learning all the techniques required to make finished products and the process of engineering from start to finish."

Apprentice profile - Michael Gallen, Apprentice at Sandvik Rock Processing - Mobile Crushing & Screening

What does your job at Sandvik entail?

The path I took to where I am now wasn't the usual path that many others have taken to the engineering field. I left school after completing eight GCSEs, and I then applied to the SWC to do the Gold level engineering to get my A-level equivalent BTEC for two years. As part of the course I needed to find a suitable job and I applied to Sandvik and was successful. I joined Sandvik 4 years ago and have gained great experience in many aspects of engineering.

Currently I am still undecided whether I wish to top up my education with a degree or finish with the foundation degree and go back at a later time in my life to top it up.

Here at Sandvik my day-to-day responsibilities include:

- Tool ordering and parts procurement
- Maintenance of LOLER (Lifting Operations and Lifting Equipment Regulations register)
- lifting equipment ordering, repairs and inspection
- General maintenance projects
- Day to day management of Camera system and Door Access Control systems

I have also worked in other positions throughout the company including:

- Working on the production line building parts for the machines produced here in Sandvik,
- Working with the production team to produce Standard Operating Procedures documentation,
- Working as part of Continuous Improvement Engineering team, developing the Manufacturing Execution System which controls our manufacturing processes
- General maintenance engineer - in this role I worked alongside some highly skilled team members where I picked up valuable skills and experiences in Maintenance Engineering including project skills, AutoCAD drawing skills and project implementation skills
- Maintenance office role, including LOLER management, Zurich Insurance inspection liaison and Agility Maintenance Project development and implementation

In the next 5 to 10 years I would like to see myself qualified with at least my foundation degree in general engineering. Career wise I would like to be in a position that allows me to travel and work around the world.

Apprentice profile - Michael Gallen (continued)

Why would you encourage people to consider a career in the Advanced Manufacturing sector?

I would encourage people to consider a career in Advanced Manufacturing as there are many different job roles and prospects with this industry.

They can range from building or repairing items, to designing new products and coming up with improvements for existing ones, all the way to ordering parts from suppliers. So while many believe working in this industry mainly involves getting dirty and dusty, building machinery and other things, it actually entails many different job roles that can be hands on or be done in an office. This means that people looking for a job that doesn't involve working with your hands can also find a role within the industry.

What advice would you give to those hoping to begin a career in the local Advanced Manufacturing sector?

My advice to people considering a job within this industry is to ***be willing to learn and adapt on the job.*** This is because ***it is an ever evolving industry with new ideas and productions,*** but also you will learn a lot quicker by following people who do the job already and learning their techniques. This will allow you to improve your abilities and skills.

A characteristic I would say someone would need is the ability to ask for help; this is because you most likely won't be able to do everything yourself and may need help. If you are unable to do something, being able to ask someone who knows how to do it will make your job easier. As for job experience, I had relatively little as I started here straight out of school at 17. However, I did have some experience with things like working on cars, so I would recommend having some knowledge of the role you wish to do within the industry, although everyone has to start somewhere.

Women in Engineering in NI

Nuala Reid, European Director of Process Development Engineering – Sensata Technologies

Nuala Reid is an Engineering graduate with over 25 years' experience across the Manufacturing, Industrial and Financial Services industries. Nuala is a Chartered Engineer, a member of the Institute of Engineering and Technology (IET) and is a certified Six Sigma Black Belt and Master Black Belt (these are certifications relating to process improvement and quality management).

Nuala's current role is European Director of Process Development Engineering at Sensata Technologies, a global industrial technology company which produces sensors and controls, including TPMS (tyre pressure monitoring systems), which are developed and manufactured here in NI. Nuala's role at Sensata involves leading a global team of engineers to develop processes to manufacture sensors for automotive customers.

Watch as Nuala shares her career journey, explains why Advanced Manufacturing is so important to NI, and offers her advice for anyone who is interested in beginning a career in the sector.

"I would describe my role as a problem solver, working with the team to improve how we deliver the best results".

Women in Engineering in NI

Rachel Pattison, Operations Improvements Manager, Terex Corporation

Rachel Pattison has a Masters in Aerospace Engineering and started her career working in the Aerospace industry, before achieving professional registration as a Chartered Engineer through the Institution of Mechanical Engineering in 2013.

Rachel subsequently changed career direction and became a manufacturing engineer with Terex Corporation, an American manufacturing company of lifting and material handling products. Rachel is based at Terex's Omagh site, and is now Operations Improvement Manager within the materials processing section, where she helps to lead the manufacturing engineering team. One of the main aspects of her role is in the introduction and readiness for new products.

Watch as Rachel explains what her role at Terex Corporation entails, shares some of the challenges and rewards of working in the Advanced Manufacturing sector and outlines the key skills requirements.

"Every day is a different experience, a new problem to solve, and a query that needs answered".

Gerard McNally, Director of the Northern Ireland Polymers Association (NIPA)

The Northern Ireland Polymers Industry

Gerry McNally MSc, CSci, FIOMM, MSPE
Director of Research Innovation and Competence - Northern Ireland Polymers Association (NIPA)

Gerry McNally brings over 40 years of industrial and academic experience to his role as the Director of the Northern Ireland Polymers Association (NIPA). A polymer engineering graduate, Gerry began his career working in the plastics industry before moving into academia at QUB in 1990, where he held several positions including co-founder and director of the Polymer Processing Research Centre (from 2003) and co-founder and research group leader of the Medical Polymers Research Institute (2004-2009). Gerry has published around 250 technical articles, participating in numerous international projects and conferences and was awarded the American Society of Plastics Engineers Educator of the Year Award in Florida, USA in July, 2012 - the first European academic to be awarded the international prize since 1976.

Below, Gerry provides an overview of the polymer industry in NI, outlining what polymers are; how they are used; and why they are so important to the Northern Ireland economy. He also explains how plastics can be recycled to produce a broad range of products.

What are Polymers?

"Poly" means "many" and "mer" means "parts".

Polymers are large molecules whose molecular weight can range from the thousands to millions. Polymers are built up by the repetition of low molecular weight units, e.g. polyethylene is made by chemically "joining" together many ethylene molecules. This chemical "joining" process is referred to as **polymerisation.**

What kind of industries make use of plastics?

Plastics have a number of advantageous properties; these include being **lightweight**, **economical,** and **versatile**, as well as **easily processed** and **manufactured**. These qualities make them suitable for use across a wide range of industries, including **food packaging; electronics; textiles; construction; automotive; marine; aerospace,** etc.

Local companies are also involved in the production of healthcare and pharmaceutical packaging; medical devices; critical care, neonatal care and respiratory care products, and personal protective equipment (PPE), such as face shields and masks.

Gerard McNally, Director of the Northern Ireland Polymers Association (NIPA) (continued)

Plastics and recycling

Did you know?.....
Waste plastic packaging can be collected, sorted, recycled and turned into a range of products as diverse as drainpipes, textiles and window frames!

Some examples of plastic recycling activity include:

Cherry Plastics, who operate a mixed plastic bottle NIR (Near Infra Red) sorting plant and a polyolefin wash and compounding facility, based in Lurgan, Co. Armagh. This facilitates the manufacture of drainage pipes from recycled polyethylene waste, such as milk cartons.

Camden, Co.Antrim, using uPVC recycling technology, recycles old PVC window frames into brand new window frames.

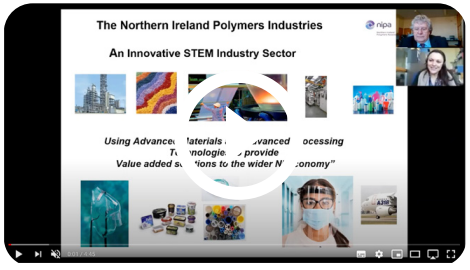
Indorama Ventures – Wellman International Ltd, Co. Cavan; **Shabra,** Co.Leitrim – PET carbonated drinks bottles can be made into fibres used in the manufacture of clothing items, such as fleeces.

Video clips - overview of the Northern Ireland Polymers Industry, including career options and entry routes

The video clips below are part of a webinar about careers in the Northern Ireland Polymers industry featuring Gerry McNally, Director of Research Innovation and Competence - Northern Ireland Polymers Association (NIPA) and Dr Asha Jamil, Life Sciences FE Curriculum Hub Manager.

In the clips, Gerry outlines the businesses in the local polymers sector and the products they manufacture, the types of careers opportunities the sector offers and the various entry routes into these careers.

The Polymers Industry in NI – overview and careers options (Clip 1)



Entry routes into the Polymers sector in NI (Clip 2)

Local companies in the NI Polymer industry (Clip 3)

Kim McCauley, Business Development Engineer, Denroy Plastics Ltd

In this article, Kim discusses her career journey into the Northern Ireland Polymers industry, including her current role as Business Development Engineer at Denroy Plastics. She outlines the qualifications, skills and experience that have helped her succeed, and shares her career goals for the future, as well as offering her advice for those considering a career in the sector.

How did you become interested in Engineering?

I became inspired by engineering at a very young age. With my grandfather designing missile systems and my mother a senior systems analyst working on government computing systems I knew there was something in it for me. This was reinforced when I watched the launch of space shuttle STS-121 and my dream of becoming an astronaut developed (still to be fulfilled however).

What kind of qualifications/ work experience did you gain in order to begin your career as an engineer?

I pursued Mathematics, Technology and Design and Physics to A Level and Computing to AS Level. For work experience, I followed in my grandfather's footsteps and undertook my time at Thales, an Advanced Weapon Systems business designing and manufacturing missile technology for the MoD and the global export market. After a mechanical engineering degree at the University of Liverpool (with my final year project in collaboration with Airbus) and a graduate placement with aerospace giant Bombardier, I became an engineer at Denroy Plastics.

What kind of products does Denroy produce and which sectors are these used in?

Based in Bangor, North Down, Denroy plastics specialises in injection moulding of plastic components and is the leading innovator in the design and manufacture of engineered polymer components and solutions. Denroy's main sectors include Aerospace, Automotive, Commercial, Defence and most recently has developed into PPE.

Kim McCauley, Business Development Engineer, Denroy Plastics Ltd (continued)

How has your career developed since you began your initial engineering role?

Denroy recruits for a wide range of expertise throughout the business. From engineers (mechanical through to design and stress) to IT and HR, to Sales and Marketing through to Research and Technology.

My first role within the company was within the quality department where I acquired a full overview of the very diverse group of sectors that Denroy is involved in.

Here, I observed all the different processes and procedures that need to occur in order to receive plastic pellets into the company and ship fully assembled parts out to customers, meeting their specific quality needs. I have had opportunities to visit places such as Hong Kong and Japan to engage with customers and to visit worldwide exhibitions.

After 2 years, I took the opportunity to join the design department and to build a completely different set of skills, and again, a new set of opportunities and courses were achieved. This provided me with an understanding around the tooling needed for injection moulding and also developed my knowledge on polymers and their uses for different applications.

At the start of 2020, I enhanced my experience further by moving into a business development role for Denroy.

What have been some of the challenges/rewards you have experienced in your career so far? Have you undertaken any additional training?

Current challenges include project managing an exciting application for a new technology involving injection moulded plastic components. My technical background is already proving beneficial within this role when engaging with tender applications, primarily from within the aerospace and defence sectors, as I build my customer contact portfolio and learn more of the financial side of business.

Kim McCauley, Business Development Engineer, Denroy Plastics Ltd (continued)

A number of developmental courses were completed along the way and I have been trained in a wide range of subjects whilst fulfilling my different roles. In the Quality department, I developed skills ranging from Auditing to GD + T (Geometric Dimensioning & Tolerancing) needed to read and understand complex CAD drawings. In Denroy's design department I trained in both CATIA and Creo CAD design packages.

Most recently within my business development role, I have undertaken Prince2 project management training, with a number of business and leadership courses thrown in along the way.

What would you say are the key skills you have developed in your career so far?

Skill sets developed throughout my career thus far (and continue to develop) include problem solving, important throughout all areas of the business. Constructing not only innovative ideas but with the practical knowledge, logical reasoning and analytical skills to back those ideas up and implement them. Interpersonal and communication skills are essential, both within Denroy and with their extensive partner and customer base worldwide.

What has been one of your career highlights to date?

Having experienced different opportunities and challenges within the company, I am now part of the team keeping Denroy at their SC21 Gold status (an aerospace accreditation which requires a minimum of 99% delivery and 99.9% quality).

How do you see your career developing in the future?

Looking forward to the next 5 or 10 years, I see myself firstly within a project management role, developing my current skillset. After that, who knows what is on the cards? Maybe I will take one of my ideas and turn it into my own business. Whatever the future holds, I continue to put in the work to develop myself and my business skills and look forward to what is next on my engineering journey.

What advice would you give to anyone considering a career in the sector?

My advice to any person considering the engineering / manufacturing sector would be to delve a little deeper into the roles that are available within this sector, do not write it off because you think you need to wear steel toe caps and a hard hat to be an engineer. Creativity, curiosity and challenging "it's the way we always do it" are what may motivate you, however, commitment, hard work and conscientiousness will get you where you want to be.

Higher Education Perspectives on the Advanced Manufacturing Sector

Dr Margaret Morgan, Associate Head of the School of Engineering at Ulster University

In this article, Margaret Morgan, Associate Head of the School of Engineering at Ulster University, reflects on her career to date, explains the impact of Industry 4.0 on Advanced Manufacturing and the skills needed to build a successful career in the sector, and outlines the range of course options offered by Ulster University.

My role in the University and career path to date

My current role is Associate Head of the School of Engineering at Ulster University. The job encompasses a wide range of activities in the School, from teaching delivery and programme enhancement, to staff support, to student liaison, so no two days are the same! I love being a lecturer and enjoy working with students as they develop into the next generation of engineers.

Within the school I work with academic colleagues who have backgrounds in engineering as well as subjects such as physics, chemistry, biology, maths and computer science. For our students and researchers this means they learn and innovate in a truly multidisciplinary teaching and research environment that provides a rich mix of perspectives. Real-life industrial experience informs everything we do, from teaching to research and helps us to ensure we deliver a packed research-informed curriculum that graduates career-ready engineers.

My pathway to becoming an engineer in industry

I enjoyed most subjects at school and decided to opt for a STEM route, choosing Maths, Physics, Chemistry and Biology at A level. My favourite subjects were Physics and Maths and I went on to study a degree in aeronautical engineering at University. My degree course included a summer industrial placement and I spent 12 weeks with Babcock Power in London. This led to an offer of sponsorship for the remainder of my degree and a job offer on graduation. Having an integral placement as part of my degree was really beneficial!

On graduation, I took a job with Unidare Engineering in Portadown as a project engineer responsible for the delivery of a new product range for the company. This design and development role gave me hands-on experience at a time when CAD systems were just beginning to be introduced into industry – developing product specifications to suit clients, preparation of drawings, fixing production snags, and working with marketing on product messaging. I later moved into production management working on a computerised stock system that would help the company reduce its raw material holdings and help manage materials and logistics more effectively. It was

Dr Margaret Morgan, Associate Head of the School of Engineering at Ulster University (continued)

implementation of this new system and my involvement in the training of company staff that paved the way for me to join Ulster University as a Lecturer in Manufacturing in 1995.

Advanced Manufacturing and Industry 4.0

Advanced Manufacturing is an umbrella term used to describe high-tech innovative processes that help manufacturers deliver product and/or process solutions that enhance their clients' competitive advantage.

Those companies that can adapt the technology, apply it, and optimise it for their particular business system will be able to realise and capitalise on the benefits. The benefits could include the use of:

- **additive manufacturing** – 3D printing of component parts with intricate shapes
- **3D rapid-prototyping** – part visualisation fosters innovation and is key in communicating ideas
- **artificial intelligence (AI)** – predicative capability used to shorten product lead times / to enhance operator training,
- **real-time sensing capability** – has transformed process flow by ensuring all parts produced are to specification
- **machine learning and data analytics** to improve and perfect process control thereby cutting product lead times and eliminating waste.
- **digitalisation** – how systems can be integrated with each other

Industry 4.0 is with us now and it is expected that the industrial landscape will see a step change as was the case with the previous industrial revolutions. The emphasis now on the knowledge economy will mean that there are job opportunities right across the engineering sector, for example in automotive, construction, materials handling, consumer and healthcare products, water, aerospace, defence, etc. as companies tackle how to realise the potential of these new technologies within their particular business units. There has never been a more exciting time to become an engineer!

Range of engineering course options in the School of Engineering at Ulster University

The School of Engineering offers a broad range of engineering courses at undergraduate and postgraduate level. At undergraduate level, bachelor and integrated masters programmes are offered in the following subject areas: Biomedical Engineering, Electronic Engineering, Engineering Management, Mechatronic Engineering (offered also as a part-time route) and Mechanical Engineering. A BSc Hons in Technology with Design – an innovative hybrid programme that straddles the subject areas of technology and design, is also available - the Technology aspects of the curriculum are delivered in the School of Engineering and the Design aspects are delivered in the Belfast School of Art.

At Masters level, we offer four programmes to cater for graduate students seeking to specialise in a particular area as well as for employees who wish to upskill or seek chartered status with one of the professional engineering bodies. Our MSc programmes include: Advanced Composites & Polymers, Biomedical Engineering, Mechanical Engineering and Manufacturing Management. Our

Dr Margaret Morgan, Associate Head of the School of Engineering at Ulster University (continued)

Postgraduate programs are offered full-time and part-time, with the part-time courses popular among employees at engineering firms who wish to provide opportunities for training and upskilling among their workforce. For details on specific courses, please see Ulster University School of Engineering.

Programmes offered in the School of Engineering are designed so that graduates are work-ready, they will have the engineering expertise and technical know-how specific to their discipline as well as relevant industrial experience. A year-long industrial placement (paid) is an integral and compulsory part of all our undergraduate programmes. Over 96% of our engineering graduates are employed in graduate positions within six months of graduation.

The key skill for success in the advanced manufacturing sector is to have an aptitude for technology and a desire for continuous improvement. Being inquisitive, practically-minded and interested in 'making things and making things better' is also important.

What kind of career options do Advanced Manufacturing courses at Ulster University have the potential to open up?

As is the case with any new technology, the real innovation and value-added for companies is in recognising how that technology can be adapted and implemented to suit their particular operating situations. **Engineers are creative and innovative people and are in the unique position of understanding both the practicalities of the products and processes used in companies as well recognising where those new technologies could be advantageous and importantly how these new technologies could be implemented.** The Royal Academy of Engineering (2014) identified six 'Engineering habits of mind' as: improving; adapting; problem-finding; creative problem-solving; visualising and systems thinking. Course teams at Ulster embed opportunities for students to develop these 'habits of mind' throughout all years of all programmes so that graduates will be able to meet the challenges/opportunities that will present in the future.

There are a broad range of careers open to engineering graduates: R&D, design, process improvement, quality engineering, methods engineering, production management, maintenance engineering, test and verification engineering: logistics engineering and so on. Additionally, engineers are often found in technical sales, teaching, accountancy or the insurance sector. Many are entrepreneurs and start their own business.

What skills and personal qualities are required to build a successful career in this sector.

Being able to build relationships with suppliers, customers and co-workers is critical as there is always fear and distrust around implementing new systems and work practices. Being a good communicator and a person of integrity helps build consensus and improves decision-making.

Lynsey Holland, Employability and Placement officer, QUB School of Mechanical & Aerospace Engineering

In this article, Lynsey Holland, Employability and Placement Officer in the School of Mechanical & Aerospace Engineering at Queen's University, Belfast, outlines the course options offered at the university and the diverse range of career prospects available to Advanced Manufacturing graduates. She also offers her advice for those seeking to build a career in this sector.

How would you define the Advanced Manufacturing sector in Northern Ireland and why should prospective students consider a career in this field?

Companies such as Caterpillar, Terex, Hyster-Yale, Telestack and CDE Global deal in bulk materials handling and processing equipment, large diesel generator sets and crushing and screening equipment. These products are then used in a number of different industries, with distribution to countries throughout the world.

Within the automotive sector companies such as Sensata, Ryobi Aluminium Casting and Linamar (Montupet) supply components and products to some of the biggest producers of cars and vehicles in the world. Similarly, within aerospace, where companies like Collins Aerospace, Thompson Aero Seating, Mallaghan GSE and SAM Aerospace support advancement through the manufacture of high quality and innovative products for some of the world's leading airline companies. These products include seats, seating components and airport ground support equipment.

Other sectors include medical device with companies such as Heartsine (part of the global Stryker group) who make heart defibrillators, as well as Andor Technology and Randox Laboratories. Within each of these companies, employees are at the forefront of cutting edge technology, often working from the concept and design stage of manufacturing, through to the production and distribution of many innovative products which are then used globally.

Advanced Manufacturing in Northern Ireland is made up of a number of companies, comprising several different sectors and supplying numerous products. It is extremely diverse and for this reason would make an excellent career choice.

Lynsey Holland, Employability and Placement officer, QUB School of Mechanical & Aerospace Engineering (continued)

Please outline the range of higher education course options that are available at QUB

QUB offer a range of undergraduate and postgraduate study options. At undergraduate level, courses options include Aerospace Engineering; Electrical & Electronic Engineering; Mechanical Engineering; Product Design Engineering; Software & Electronic Systems Engineering, etc.

At postgraduate level, course options include Electronics with Professional Internship; Engineering Management; Materials Science & Engineering; Mechanical Engineering with Management & Industrial Internship, etc.

You can find full information on the range of options available by checking the Queen's University website - Queen's University Belfast website

What kind of careers options do Advanced Manufacturing courses at QUB have the potential to open up?

There is a vast array of career choices available within Advanced Manufacturing for a student who studies an appropriate course, working in a broad range of sectors. **Within Northern Ireland there is strong manufacturing provision related to industries including automotive, built environment, infrastructure, transportation, energy, utilities, aerospace, medical device, quarrying and power generation.**

These will always be changing, innovating and growing and therefore a career in this field would require the ability to adapt to this with resilience, drive and determination.

Careers within these areas would typically include roles such as Specialist Engineer (design, production, manufacture, maintenance), Supply Chain, Research & Development, Quality Assurance, New Product Implementation, Technical Sales & Marketing, Finance & Management and Consultancy.

For those interested in working in this area, useful information in relation to companies within Northern Ireland would include company size, structure, culture, key projects, major technologies used, key developments, strategic plans, recent company news and any awards received.

What advice would you give to someone who is interested in building a career in this area?

A career in Advanced Manufacturing is extremely diverse and would offer an employee exposure to many different and exciting facets of the workplace. From roles on the frontline, working directly on the manufacture of various components and products, to those working in research and development and quality, an array of both technical and transferable skills would undoubtedly be developed.

Optimising equipment performance, providing support to production lines and ensuring the design and quality of products are of the best possible standard are amongst the challenges that would be faced.

Lynsey Holland, Employability and Placement officer, QUB School of Mechanical & Aerospace Engineering (continued)

A graduate with a degree qualification in mechanical engineering, or similar, would typically expect to start in one area of the business as an engineer, offering support to a small team on a diverse range of complex problems and issues.

An expectation would be that realistic and achievable solutions could be provided to enhance and improve products and services. Your role could involve hands-on elements such as testing, operating, fixing and fitting, as well as the opportunity to use several different types of software for designing parts, providing data analysis and calculations, as well as programming. Project management and input to continuous improvement would be expected, using tools such as Lean Manufacturing and Six Sigma. More recent features within Advanced Manufacturing include elements of automation and robotics and as a graduate engineer you will be at the forefront of developing these techniques for the enhancement of products and components.

Transferable skills required for a career in Advanced Manufacturing which are considered pivotal include communication, team working, leadership, problem solving, planning, adaptability and flexibility, motivation and enthusiasm and the ability to build relationships.

Transferable skills required for a career in Advanced Manufacturing which are considered pivotal include communication, team working, leadership, problem solving, planning, adaptability and flexibility, motivation and enthusiasm and the ability to build relationships.

MEGA-Ulster University Degree Apprenticeship in Manufacturing Engineering

MEGA Degree Apprenticeship in Manufacturing Engineering

In partnership with Ulster University's School of Computing, Engineering and Intelligent Systems at Magee, MEGA are stepping outside of their Mid Ulster area to deliver an exciting and innovative Degree Apprenticeship that will aid manufacturing & engineering companies across NI (subject to funding & approval).

Ulster University has worked closely with the MEGA network to create a degree that reflects the needs of industry preparing to embrace a range of technological advancements in robotics, automation and digitalization. The 4th Industrial revolution is underway and many companies are unable to find employees with the right skills to help them take advantage of the opportunities this shift will bring for increased productivity and exports.

Ulster University and MEGA aim to create a highly sought after 'Industry Approved' Degree Apprenticeship that will attract a suitably high calibre of applicants into the industry.

This 4-year programme is aimed at people who wish to attain a Level 6 Honours Degree with highly sought-after, employable skills for the engineering & manufacturing industry. The degree content dictates these Apprentices must have proven, high academic achievement for successful completion of the programme.

This Degree Apprenticeship presents an alternative to the traditional degree route that will see participants employed from day one in an earn-as-you-learn model. This means participants of the programme incur no cost in their higher-level education, in fact they earn a wage. As a Degree Apprentice, they will apply their theory in real-time making instant impact within their company. This is an amazing opportunity to build an impressive CV alongside studying a degree. What a platform to build their career on and what an amazing opportunity for participating companies to shape their future engineering team to help them remain competitive in the global market.

If you would like more information on how to be part of this ground-breaking Degree Apprenticeship scheme that aims to commence in September 2021. Please visit the MEGA website and fill out the company enquiry form.

Entrepreneurship in Engineering

Royal Academy of Engineering

THIS IS ENGINEERING

The **Royal Academy of Engineering Enterprise Hub** established its first regional base in Northern Ireland in October 2020, supported by Invest NI and based at Ormeau Baths co-working space in Belfast.

Northern Ireland has a vibrant and diverse engineering and technology sector, exporting to all corners of the globe. The Hub aims to champion ambitious engineering entrepreneurs in Northern Ireland, supporting the region's brightest technology and engineering entrepreneurs to realise their potential. The Hub runs programmes for entrepreneurial engineers at different career stages by offering funding and mentorship, coaching and support through its network of engineers and innovators.

SENERGY

Video profile - Senergy

Find out more about the support the Royal Academy of Engineering Enterprise Hub can provide to engineers and innovators during their entrepreneurial journey by watching this short video, featuring Christine Boyle, CEO of Senergy, a local company designing and developing nano-composite solar thermal panels.

Further resources

You can find a wealth of resources on engineering careers on the Royal Academy of Engineering and This is Engineering websites.

Pathways into AMME Careers in NI

Advanced Manufacturing - entry routes

There are a number of progression routes available in Northern Ireland for those interested in beginning a career in the Advanced Manufacturing sector. The sector offers a diverse range of career opportunities and which route is best for each individual will depend on a number of factors, such as specific career goal, preferred learning style, etc. Please check employer websites for further details of accepted/desirable qualifications.

Overleaf you will find information on local Advanced Manufacturing-based courses **(it should be noted that course provision may be subject to change, please check with course provider for the most up-to-date guidance on course options and entry criteria).**

For more information on possible entry routes into your desired role, please refer to our range of online career tools

Qualifications – what the different levels mean

Qualifications are grouped together into levels to show how they compare and what other qualifications they can lead to. You can find out more about this in Qualifications: what the different levels mean.

The following mapping tool highlights programmes available at local colleges of further and higher education and articulation routes through the course levels.

Contact a Careers Adviser

If you would like to talk through your career options with a careers adviser, get in touch

Further Education: Engineering Qualification Pathways

Level 6	→ Degree	→ OU Top Up Degree in Engineering
Level 5	→ Foundation Degree (FD) (LEVEL 6 / LEVEL 4) → HND (LEVEL 4) → Higher Level Apprenticeship (HLA) (LEVEL 6 / LEVEL 4)	→ FD Electrical and Electronic Engineering → FD Mechanical Engineering → FD in Mechatronic Engineering → HND L5 in General Engineering → HND L5 in Electrical and Electronic Engineering HLA FD in Engineering
Level 4	→ HNC (LEVEL 5)	→ HNC in Manufacturing Engineering → HNC in Aeronautical Engineering → HNC L4 in General Engineering
Level 3	→ Level 3 BTEC (LEVEL 4 / LEVEL 4) → A' Levels (LEVEL 4 / LEVEL 4) → Access Diploma (LEVEL 4 / LEVEL 4) → Level 3 Apprenticeship (LEVEL 4 / LEVEL 4)	→ L3 Diploma in Engineering → L3 Electrotechnical → L3 Fabrication & Welding Engineering → L3 in Aeronautical Engineering → Electrical & Electronic Engineering → L3 Extended Diploma in Engineering → L3 National Extended Certificate Engineering → L3 in Electrical & Electronic Engineering
Level 1&2	→ GCSE (LEVEL 3) → Level 1 / 2 BTEC / OCR (LEVEL 3) → Level 2 Traineeships (LEVEL 3) → Level 2 Apprenticeship (LEVEL 3) → Skills for life and work (LEVEL 2)	→ Level 1/2 in Fabrication & Welding → Level 1/2 Performing Engineering Operations → Level 1/2 Parametric Modelling → Level 1/2 Diploma in Engineering

Course provision at local colleges of further and higher education

Further Education College Course provision - Advanced Manufacturing			Mode of Attendance	SERC	SRC	NWRC	NRC	BMET	SWC
Level 1	FE	Certificate in Engineering	FT		✔			✔	✔
		Electrical & Mechanical Engineering	FT				✔		
	Training	City & Guilds Welding	PT	✔	✔	✔			✔
		Certificate in Performing Engineering Operations	PT					✔	✔
Level 2	FE	Fabrication & Welding	FT			✔		✔	
		Electrical & Mechanical Engineering	FT			✔	✔		
		Engineering	FT		✔				✔
	Training	Fabrication & Welding	PT	✔	✔		✔	✔	✔
		Mechanical Engineering	PT	✔	✔		✔		
		Maintenance Engineering	PT		✔		✔		
		Electrical & Electronic Engineering	PT		✔		✔		
		Engineering	PT		✔		✔		✔
	Apprenticeships	Fabrication & Welding	PT	✔	✔	✔	✔	✔	✔
		Mechanical Engineering	PT	✔	✔	✔	✔		
		Maintenance Engineering	PT		✔		✔		
		Electrical & Electronic Engineering	PT		✔		✔		
		Engineering	PT		✔		✔		✔

Further Education College Course provision - Advanced Manufacturing			Mode of Attendance	SERC	SRC	NWRC	NRC	BMET	SWC
Level 3	FE	National Diploma/Extended Diploma Engineering	FT		✔	✔	✔	✔	✔
		National Diploma/Extended Diploma in Advanced Manufacturing Engineering	FT	✔	✔	✔	✔	✔	✔
		National Diploma/Extended Diploma Mechatronics	FT	✔					
		National Diploma/Extended Diploma in Advanced Electronics	FT	✔					
		Aeronautical Engineering	FT					✔	
		Manufacturing Engineering	FT			✔	✔	✔	✔
		Electrical & Electronic Engineering	FT				✔	✔	
	Apprenticeships	Fabrication & Welding	PT	✔	✔	✔	✔	✔	✔
		Technical Support	PT	✔	✔		✔		✔
		Mechanical Manufacturing Engineering	PT	✔	✔	✔	✔	✔	✔
		Maintenance Engineering	PT	✔	✔	✔	✔		✔
		Mechanical Engineering	PT	✔	✔	✔	✔		✔
		Engineering	PT		✔		✔		✔
		Polymer Processing Operations	PT	✔					
		Automotive Engineering	PT				✔		
		Technician Apprenticeship Level 3 (Level 2 en route)	PT	✔					✔

Further Education College Course provision - Advanced Manufacturing			Mode of Attendance	SERC	SRC	NWRC	NRC	BMET	SWC
Level 4	HE	Pearson BTEC HNC Engineering	PT	✔	✔	✔	✔		✔
		HNC Electrical & Electronic Engineering	PT			✔			
		Pearson BTEC HNC Engineering	FT					✔	
		HNC Aeronautical Engineering	FT					✔	
	Higher Level Apprenticeships	Advanced Technician Engineering (HNC)	PT	✔	✔	✔	✔	✔	✔
Level 5	HE	BTEC HND Engineering	FT	✔					
		HND Electrical & Electronic Engineering	FT	✔					
		Foundation Degree Manufacturing Engineering	FT						✔
		Foundation Degree Mechatronic Engineering	FT	✔	✔				✔
		Foundation Degree Mechanical Engineering	FT			✔		✔	
		Foundation Degree Electrical & Electronic Engineering	FT			✔	✔	✔	
		Foundation Degree Mechanical & Manufacturing Engineering	FT				✔		
	Higher Level Apprenticeships	HND Electrical & Electronic Engineering	PT					✔	
		Foundation Degree Mechatronic Engineering	PT	✔	✔				✔
		Foundation Degree Electrical & Electronic Engineering	PT			✔	✔		
		Foundation Degree Mechanical & Manufacturing Engineering	PT			✔	✔		
		Foundation Degree Manufacturing Engineering	PT						✔
		Advanced Manufacturing	PT				✔		

Further Education College Course provision - Advanced Manufacturing			Mode of Attendance	SERC	SRC	NWRC	NRC	BMET	SWC
Level 6	HE	BEng Hons Engineering (Top Up)	PT/FT						✔
	Higher Level Apprenticeships	BEng Hons Degree Engineering (Top Up)	PT						✔

Undergraduate courses

Queen's University Belfast

Course title/UCAS code	Duration/Mode of attendance
Aerospace Engineering BEng UCAS code: H400	3 years FT
Aerospace Engineering Sandwich BEng (includes placement year) UCAS code: H404	4 years FT
Aerospace Engineering MEng UCAS code: H402	4 years FT
Aerospace Engineering Sandwich MEng (includes placement year) UCAS code: H405	5 years FT
Electrical & Electronic Engineering BEng UCAS code: H600	3 years FT
Electrical & Electronic Engineering Sandwich BEng (includes placement year) UCAS code: H604	4 years FT
Electrical & Electronic Engineering MEng UCAS code: H602	4 years FT
Electrical & Electronic Engineering Sandwich MEng (includes placement year) UCAS code: H605	5 years FT
Mechanical Engineering BEng UCAS code: H300	3 years FT
Mechanical Engineering Sandwich BEng (includes placement year) UCAS code: H304	4 years FT

Course title/UCAS code	Duration/Mode of attendance
Mechanical Engineering MEng UCAS code: H303	4 years FT
Mechanical Engineering Sandwich MEng (includes placement year) **UCAS code: H305**	5 years FT
Product Design Engineering BEng UCAS code: H150	3 years FT
Product Design Engineering Sandwich BEng (includes placement year) UCAS code: H151	4 years FT
Product Design Engineering MEng UCAS code: H152	4 years FT
Product Design Engineering Sandwich MEng (includes placement year) UCAS code: H155	5 years FT
Computer Engineering BEng UCAS code: GH6P	3 years FT
Computer Engineering BEng with a year in industry UCAS code: GH67	4 years FT
Computer Engineering MEng UCAS code: GH6Q	4 years FT
Computer Engineering MEng with a year in industry UCAS code: GH68	5 years FT
Software Engineering BEng with Placement UCAS code: G604	4 years FT
Software Engineering MEng UCAS code: G602	4 years FT
Software Engineering MEng with Placement UCAS code: G605	5 years FT

Ulster University

Course title/UCAS code	Campus	Duration/Mode of attendance
Biomedical Engineering BEng Hons UCAS code: BH81	Belfast	4 years (including placement in Year 3)
Biomedical Engineering MEng Hons UCAS code: BH82	Belfast	5 years (including placement in Year 3)
Electronic Engineering BEng Hons UCAS code: G601	Belfast	4 years (including placement in Year 3)
Electronic Engineering MEng Hons UCAS code: H600	Belfast	5 years (including placement in Year 3)
Engineering Management BEng Hons UCAS code: H710	Belfast	4 years (including placement in Year 3)
Engineering Management MEng Hons UCAS code: H712	Belfast	5 years (including placement in Year 3)
Mechanical Engineering BEng Hons UCAS code: H300	Belfast	4 years (including placement in Year 3)
Mechanical Engineering MEng Hons **UCAS code: H302**	Belfast	5 years (including placement in Year 3)
Mechatronic Engineering BEng Hons UCAS code: H302	Belfast	4 years (including placement in Year 3)
Mechatronic Engineering MEng Hons UCAS code: H733	Belfast	5 years (including placement in Year 3)
Technology with Design BSc Hons UCAS code: H1W2	Belfast	4 years including placement in Year 3
Mechanical & Manufacturing Engineering BEng Hons UCAS code: HH37	Magee	4 years (including placement in Year 3)
Mechanical Engineering with Enterprise Dev BEng Hons UCAS code: HH38	Magee	4 years (including placement in Year 3)
Electrical and Electronic Engineering BEng Hons UCAS code: H602	Magee	4 years (including a year's work experience in Year 3)
Electrical Engineering with Enterprise Dev BEng Hons UCAS code: HH38	Magee	4 years (including a year's work experience in Year 3)

Degree Apprenticeship

Course title	Campus	Duration/Mode of attendance
MEGA Degree Apprenticeship in Manufacturing and Engineering BEng Hons	Magee (Ulster University)	4 years (Year 1 - 24 weeks at Magee campus, Ulster University; Years 2-4 - 1 day per week in Magee campus, Ulster University)

Postgraduate courses

QUB

Course title	Mode of study and duration
Electronics/Electronics with Professional Internship MSc	1 year FT/2 years PT
Engineering Management PgCert	1 year PT
Mechanical Engineering PgCert	1 year P/T
Mechanical Engineering with Management PgDip, MSc	PgDip – 1 year F/T, 3 years P/T MSc – 1 year F/T, 3 years P/T
Mechanical Engineering with Management & Industrial Internship MSc	1 year F/T, 3 years P/T
Materials Science and Engineering/ Materials Science and Engineering (with professional internship) MSc	1 year FT/2 years PT 2 years FT/3 years PT (internship option)

Ulster University

Course title	Campus	Mode of study and duration
Advanced Composites & Polymers PgDip/MSc	Belfast	1 year FT, 2/3 years PT
Biomedical Engineering PgDip/MSc	Belfast	1 year FT, 2/3 years PT
Manufacturing Management PgDip/MSc	Belfast	1 year FT, 2/3 years PT
Mechanical Engineering MSc	Belfast	1 year FT/3 years PT
Smart Manufacturing Systems MSc	Magee	1 year FT/3 years PT

Open University

The Open University offers the following courses via distance learning:

Undergraduate

X11 Foundation Degree in Engineering

Q78 Top-up Bachelor of Engineering (BEng) (Hons)

Q65 Bachelor of Engineering (BEng) (Hons)

M04 Master of Engineering (MEng)

R62 BSc (Honours) Computing with Electronic Engineering

Q61 BA/BSc (Hons) Design and Innovation

Q67 BSc (Hons) Computing & IT and a Second Subject – can be combined with Design or Business as a Second Subject

R28 BSc (Hons) Combined STEM degree

Postgraduate

F46 MSc in Engineering

F36 MSc in Technology Management

F47 MSc in Systems Thinking in Practice

F65 MSc in Environmental Management

F69 MBA (Technology Management)

Please visit The Open University website to find out more.

Useful AMME Careers Websites

Useful Websites

Careers Service - for information on the range of online career support tools available, see Careers online support

Pulsar - home of the NI WISE (Women in Science and Engineering) Hub

Matrix NI

Invest NI

Manufacturing Northern Ireland

Northern Ireland Polymers Association

Northern Ireland Technology Centre

Advanced Manufacturing Innovation Centre - One of Belfast Region City Deal's Innovation Projects

South West College InnoTech Centre

South West College STEM Centre

South West College Idea Centre

CREST centre at South West College

MEGA (Manufacturing & Engineering Growth & Advancement)

UK-wide websites

Prospects – article on the engineering and manufacturing sector in the uk

Enginuity

UCAS - Explore degree programmes and careers

Neon Futures

The Engineer

Engineering Council (UK regulatory body for the engineering profession)

Royal Academy of Engineering - Education

This is Engineering

Professional bodies

Institution of Engineering and Technology

Engineers Ireland

Institution of Mechanical Engineers

Royal Aeronautical Society

Institute of Materials, Minerals and Mining

Feedback

The COIU team welcomes your feedback on the content of this bulletin to help inform future bulletins. If you have any comments, please email the mailbox - COIU@economy-ni.gov.uk

Please note, the information contained in this bulletin is correct at the time of going to print however, may be subject to change at any time.