AIMS CASE STUDY

CFEN WORK EXPERIENCE WEEK | 23-27 OCTOBER 2023

AIMS
Advancing Innovative Manufacturing in the south of Scotland

CFEN are Foundation Apprenticeship in Engineering at SCQF Level 6 students studying at Dumfries and Galloway College.

This is a two-year course with attendance at college for one day per week in the first year and two days per week in the second year of the course. There is also work experience with local employers built into the course programme.

Progression from the Foundation Apprenticeship can be into higher education with an HNC course or into employment within the Electrical or Mechanical sectors.

Career prospects could include an aerospace engineer, chemical engineer, electrical engineer, mechanical engineer, or naval architect. They might not always be sitting at a desk and could be working in a laboratory, at sea, underground or a recording studio.

CONNECTING WITH DYW D&G

DYW DUMFRIES & GALLOWAY Developing the Young Workforce

Caroline Davidson, Programme Manager from DYW D&G coordinated students based at Dumfries and Galloway College with employers over the region within various sectors for their work experience.

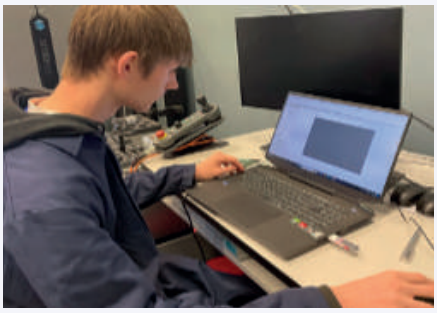
Caroline approached the AIMS Project and asked if we could take on 5 engineering students for their work experience.

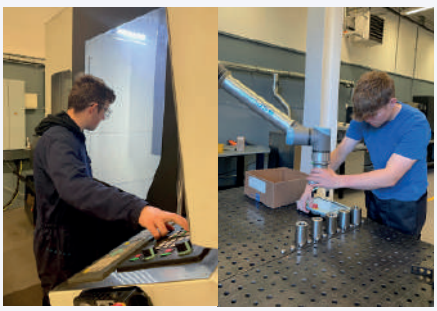
The AIMS Project were delighted to mentor these students and give them some real-life work experience within our workshop based at Dumfries and Galloway College.

OVERVIEW OF THE WEEK

THROUGHOUT THE WEEK THE STUDENTS COVERED THE FOLLOWING SUBJECTS:

- Introduction to CNC Milling
- Introduction to CNC Turning
- CAD
- 3D Printing
- Robotic Welding
- Executing programmes on the collaborative robots
- As well as any general maintenance tasks given on the day.





WORK EXPERIENCE EXECUTION

Paul Murie, AIMS Technical Officer gave the students a health and safety induction at the start of the week which included the wearing of PPE throughout their time in the workshop.

Each student was given the opportunity to obtain training and work on each of our technologies within the workshop as well as general maintenance tasks like what they would experience in the industry.

Paul Murie, AIMS Technical Officer led the training for the week and Joanne Johnstone, AIMS Business and Facilities Coordinator and Graham Anderson, D&G College Engineering Lecturer were there onsite to supervise and help where required.

CNC MILLING

The students were taught how to set up, program and operate the machine, and execute a job from a CAD model. A complex component was programmed using hypermill CAD CAM and the first article was machined using simultaneous 5 Axis tool path.

AIMS CASE STUDY

CNC TURNING

The students were taught how to set up and operate the machine, program and execute a job from a drawing.
The students had the opportunity to work on some actual client projects. This was beneficial to the students as they got to experience life in the industry which was much more meaningful than a simulation or demonstration.

CAD DESIGN

The students used Solidworks which is a 3D CAD design software to digitally model their designs using an XYZ principle. These designs were used to manufacture the components on our 3D printing systems. The design can be manufactured either by traditional subtractive manufacturing such as CNC Milling or Turning or by modern additive manufacturing such as 3D Printing.

The students had the opportunity to work on actual clients' projects which as stated above was more meaningful to them.

3D PRINTING

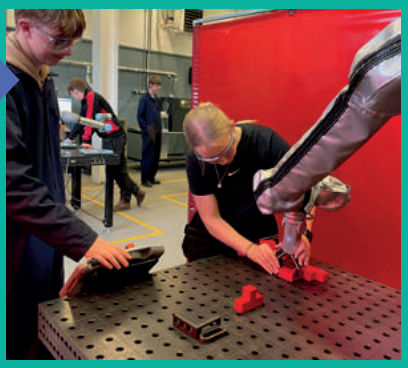
The students were taught how to set up the printers, changing the printing material and support nozzles. They were shown how to convert their CAD designs into 3D printed models by using Grabcad Print software. They learned how to orientate the job, change the support settings, the density of the material, they worked out estimates of the volume of print material and the overall print time to determine the most efficient way of printing.

The students worked on client projects and designed work holding devices such as tablet holders and hinges for the cobots.

The students were shown examples of where 3D printing comes into fruition for example, prototyping, testing out or doing a 'dry run' before manufacturing on more expensive material such as steel and making jigs and fixtures for the CNC Milling and Turning machines.

COLLABORATIVE COBOTS

The students learned how to programme the cobots to perform complex pick and place demonstrations using various types of commands and movements. They uninstalled and reinstalled various end defectors using their problem-solving skills. They set up the cobots for a high-profile visit and where able to explain what they had learned and the purpose of the demonstration to the visitors.

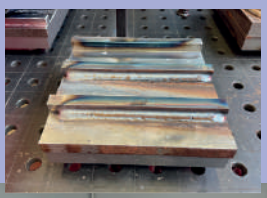


AUTOMATED WELDING

AIMS Project has one of their collaborative cobots attached to a Lorch welding rig. The students were taught a basic welding procedure using the cobot waypoint programming. This demonstrated an old technology being used in a modern and safe environment.

The students understood that welding has a significant skills gap in the area and by learning this technology would enable a less skilled technician to do the job by simply learning how to programme the cobot.

The students realised the benefits of this automated technology as this system would be able to perfectly weld every time and could potentially be set up for 'lights out' manufacturing.



OUTCOME AND ACHIEVEMENTS

AIMS Project were delighted to award all 5 students with a certification of attendance and a job reference.
Massive well done to Connor, Euan, Harley, Hayley and Jake they were always reliable, willing to learn and resourceful. They managed to complete any task assigned to them using their problem-solving skills. They were all a delight to work with and are an asset to the college.
Paul Murie, AIMS Technical Officer and Joanne Johnstone AIMS Business and Facilities Coordinator would like to thank Graham Anderson, Engineering Lecturer for all his help and support during the week and to Caroline Davidson, Programme Manager, DYW D&G for her organisation.

Prepared by Paul Murie, Technical Officer and Joanne Johnstone, Business and Facilities Coordinator November 2023

PROJECT PARTNERS

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Dumfries and Galloway College

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