SEPTEMBER 2024 ISSUE 999

The Chemical Engineer

CHEMICAL AND PROCESS ENGINEERING NEWS AND VIEWS, BROUGHT TO YOU BY THE INSTITUTION OF CHEMICAL ENGINEERS

GRAND DESIGNS

HOW TO ACE YOUR FINAL YEAR STUDEN ROJECT

PLUS...MENTORING & REVERSE MENTORING / DEGREE APPRENTICESHIPS / G FETY'S CINDERELLA

This article first appeared in *The Chemical Engineer*, which is published monthly by the Institution of Chemical Engineers
Editorial: aduckett@icheme.org, Subscriptions: sales@icheme.org
Advertising: timp@media-shed.co.uk
www.thechemicalengineer.com

Degree Apprenticeships

A Working Pathway for Students and Employers

Deborah Darnell catches up with an employer, university, and recent apprentice to discuss the benefits of degree apprenticeships and outlines what IChemE will be doing to help support the burgeoning pathway

WE KNOW that for an increasing number of young people, degree apprenticeships are an attractive option: there is a growing range of quality degrees on offer, and they allow school leavers to "earn while they learn", so reducing the financial burden. Add to that a secure job at the end of it and you have a viable alternative to the traditional routes that have dominated in the past.

They also make sense for universities struggling to plug the gap left by reduced intakes of international students (migration policies making it more difficult and expensive for overseas students to get visas). With the domestic tuition fee having remained frozen for the last ten years, it has prompted increased interest in providing degree apprenticeships as an alternative funding stream – UCAS data shows that 40% of all UCAS registrants are interested in apprenticeships.

Unfortunately, our sector has been behind other engineering sectors in the adoption of degree apprenticeships. That is why IChemE is committed to engaging with vocational routes, both by opening and facilitating discussion between academia and potential employers and by raising awareness of chemical engineering and process engineering and the opportunities it offers to young people.

UCAS data shows that 40% of all UCAS registrants are interested in an apprenticeship

This will ensure our profession has both the calibre and breadth of educational opportunities available to school leavers. Early evidence of this coming to fruition can be seen at Teesside University where collaboration between IChemE, the university, and industry has resulted in a sizable first cohort for their Science Industry Process and Plant Engineer Degree Apprenticeship.

Furthernore, academic institutions that provide a degree accredited by IChemE and have the degree element of the apprenticeship accredited by IChemE will be celebrated as an IChemE Pathway Centre (more to come on this in the coming months).

With an urgent need for more chemical, biochemical, and process engineers to fill the skills gap and address the growing needs in sustainability, larger companies are already recruiting into Accredited Company Training Schemes (graduate development) and degree apprenticeships.

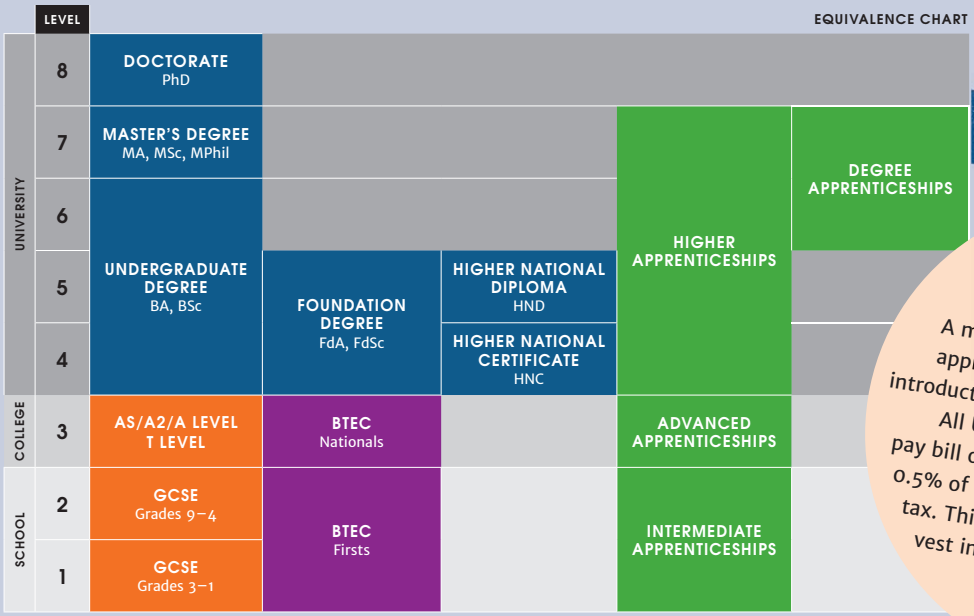
Offering an apprenticeship can:

- introduce fresh talent and ideas to your business by recruiting new staff and upskilling existing members
- align training to your business needs
- boost staff loyalty and motivation (government studies show that because of apprenticeships, 80% of employers report higher staff retention, while 92% see a boost in workforce motivation and satisfaction)

A St Martin's Group study on the benefits of apprenticeships found that, despite associated costs, UK employers see an average annual gain of £2,500 to £18,000 in output per apprentice during their training period.

HOW DEGREE APPRENTICESHIPS WORK ACROSS THE UK

Degree apprenticeships take three to six years to complete and involve spending about 80% of your time working and 20% studying at university. This might be one or two days per week, or in short blocks, such as a week at a time. Degree apprenticeships work differently depending on where you are in the UK. England and Wales both offer degree apprenticeships, with England dominating the offerings. In Scotland, degree apprenticeships are known as graduate apprenticeships. Northern Ireland offers higher level apprenticeships (HLAs) that offer you qualifications up to Level 7, which is the equivalent of a master's degree. However, the majority are at Level 5, which is equivalent to a foundation degree.



APPRENTICE LEVY

A major turning point in the degree apprenticeship story came with the introduction of the Apprentice Levy in 2017. All UK companies with an annual pay bill of over £3m (US$3.8m) must pay 0.5% of their payroll each month as levy tax. This levy can then be used to invest in apprenticeship training for their workforce.

FROM A GRADUATE APPRENTICE'S PERSPECTIVE

GEORGIE JOHNSON-GREENING AMICHEME – SENIOR PROCESS ENGINEER AT ASTRAZENECA

My journey with AstraZeneca began in 2018 when I joined as a process engineering apprentice after completing my A-Levels in maths, chemistry, and psychology. Nearly six years later I am now a senior process engineer working in drug substance manufacture at AstraZeneca's Macclesfield site.

As a practical learner, the university route did not seem like it would complement my style of learning, and after working a part-time job throughout my teenage years I realised that working as part of a team and interacting with people was a passion of mine. This drive to learn and work simultaneously led me to the apprenticeship route, as I believed that an apprenticeship would be more beneficial in terms of my personal and career development and would provide me with a more rounded learning experience compared to the traditional university route.

Throughout Sixth Form I knew that I wanted to work in the pharmaceutical industry and that I had a passion for science, but I wasn't set on a career path. I had initially planned to study chemical engineering at university before changing to apply for pharmacology. This uncertainty in what career path to choose followed all the way through to the application for AstraZeneca's apprenticeship schemes; after applying for the Laboratory

I realised I could have the best of both worlds – the process engineering apprenticeship would give me the opportunity to train as a chemical engineer in the pharmaceutical industry

Scientist Apprenticeship, the recruitment team advised me I would be a better fit for the Process Engineering Apprenticeship. That was the moment I realised I could have the best of both worlds – the process engineering apprenticeship would give me the opportunity to train as a chemical engineer in the pharmaceutical industry. It was an offer I couldn't refuse!

As an apprentice I was trained to operate a chemical plant, which is something not many 18-year-olds get to experience. This was a theme throughout the apprenticeship; I found myself in situations most people my age do not get to experience, for example meeting senior leaders of a global organisation, experiencing three different types of manufacturing plants, or leading projects which would ultimately have an impact on patients' lives.

Juggling the degree, relocating to Macclesfield, starting a new job and adjusting to a 24/5 shift pattern was tough initially. However, once I had learned how to cope with the 12-hour day and night shifts the study time was easier to manage. Aside from my contracted eight hours per week of study during work hours, I would also study on my shift rest days, evenings, and weekends to complete my university work.

Throughout the course of the apprenticeship the university workload ebbed and flowed so adjusting to the demands of university throughout the year was key to keeping on top of the degree, which at times was easier said than done. Admittedly, the final term of the degree was very time-consuming, and of course stressful, but the relief of submitting the final project and the joy of receiving my degree award made it all worth it! And now I can proudly say that I am a qualified chemical engineer, with nearly six years of valuable industrial experience across four different roles in a global pharmaceutical organisation.

The value of the apprenticeship hit home when I managed to secure a senior engineer role less than three months after graduating, a role I know I would not have secured if I had just completed a full-time degree. The opportunities and experiences gained throughout the apprenticeship have given me a rounded skillset; I have developed my soft skills, as well as technical capability in a range of functions, learning to adapt to new environments and areas of the business, and of course there is the added bonus of earning a salary throughout.

I am now excited to be in a position to give back to the Process Engineering Apprenticeship scheme at AstraZeneca and support our future engineers in achieving their career and educational goals.

FROM AN EMPLOYER'S PERSPECTIVE

ADAM PONDOR, PRINCIPAL PROCESS ENGINEER AT CAVENDISH NUCLEAR

Full-time university degrees aren't for everyone and the ability to earn and study at the same time suits many people. By diversifying how we recruit early careers we get some amazing applicants with a wealth of varying experiences, which will only bolster our process engineering department. With our apprentice route we've found that some may have significant experience in the workplace while for others this may be their first job straight out of college.

The pros are we get employees who are eager to pursue their development, gain a chemical engineering degree, get chartered, and earn at the same time.

The cons are minimal. Our main issues come from them

not having the engineering knowledge that a graduate would have on day one – trying to teach them early and quickly while having them work on actual live projects and delivering good quality work.

From the experiences we've gained from hiring our current apprentices – their ambition, determination, willingness to learn – we hope to increase our intake in the upcoming years.

For us, apprenticeships have proven to be a highly valuable route to gaining exceptional individuals and getting them early in their career journeys.

FROM A UNIVERSITY'S PERSPECTIVE

TEESSIDE UNIVERSITY

Tees Valley is a global leader in the chemical and process industry, contributing 30% of the UK's chemical output and housing some of the world's largest chemical manufacturers. Teesside University has a long history of partnering with industry leaders to create apprenticeships that align with workforce needs. Our latest initiative, the Science Industry Process and Plant Engineer Degree Apprenticeship, aims to address the critical skills gap in chemical and process engineering.

TACKLING CRITICAL SKILLS SHORTAGES

Traditional educational pathways can fail to meet industry demands, leaving businesses struggling to find and retain qualified professionals. Our new apprenticeship programme offers a direct pipeline of skilled, job-ready workers who are committed and prepared to excel from day one.

FLEXIBLE LEARNING FOR SHIFT WORKERS

Understanding the challenges of shift work in science and process manufacturing, our Level 6 Degree Apprenticeship is designed for flexibility. Delivered entirely online, the programme includes live lectures, seminars, and self-directed learning, all within a virtual environment. Each apprentice is supported by a personal quality coach who provides regular guidance to ensure successful completion. An annual conference brings apprentices together to network, share ideas, and foster a community of practice. This flexible approach ensures businesses maintain productivity while employees upskill.

INDUSTRY-RELEVANT CURRICULUM

Developed in consultation with industry partners, our curriculum covers essential topics such as chemical engineering principles, process design, safety management, and sustainability practices. The programme incorporates digital capabilities, data analytics, and process simulation across all modules. Project-based learning allows apprentices to apply practical skills and knowledge directly to their business contexts, bringing cutting-edge knowledge and innovative solutions that drive progress and efficiency.

STRONG INDUSTRY COLLABORATION

We collaborate closely with leading science and manufacturing companies to keep the curriculum relevant and aligned with industry standards. These partnerships provide apprentices with hands-on experience and a deep understanding of workplace dynamics, preparing them to make significant contributions to their organisations. For businesses, this means access to a talent pool finely tuned to industry needs, capable of making an immediate impact.

ADVANCED ONLINE DELIVERY

Our apprenticeship programme leverages advanced educational technologies to create an interactive and effective learning environment. Virtual labs and simulation tools provide hands-on experience akin to traditional settings. The robust learning management system (LMS) – a software application used to plan, implement and assess a specific learning process – supports flexible learning, allowing apprentices to balance their studies with professional responsibilities. Regular virtual meetings and mentorship sessions offer continuous support, ensuring businesses have skilled and well-supported employees.

RIGOROUS ASSESSMENT AND ACCREDITATION

The programme includes a comprehensive assessment framework combining coursework, practical projects, and examinations. Upon completion, apprentices receive a nationally recognised qualification equivalent to a bachelor's degree. This empowers them to advance in their careers confidently. For businesses, it guarantees employees who meet high industry standards and are equipped with the skills and knowledge to excel and drive the organisation forward.

BROADER BENEFITS FOR BUSINESSES

Our apprenticeship programmes offer several benefits to businesses:

- **Attract and retain top talent**: appeal to highly skilled individuals by offering a pathway to professional growth
- **Demonstrate commitment to staff investment**: show dedication to developing your workforce
- **Enhance and develop workforce**: equip your team with the latest skills and knowledge
- **Fill higher-level skill gaps**: address specific skill shortages within your organisation
- **Grow your business**: improve business performance and increase productivity

For more information on how this programme can benefit you or your business, contact Jo Burgess, director of professional apprenticeships, at j.burgess@tees.ac.uk

SOLVING PROBLEMS

Demand for degree apprenticeships is growing among school leavers. If we want to fill the skills gap and build a healthy pipeline for future requirements, individuals, and organisations within the sector need to engage with the apprenticeship process. For some it may be difficult to see how your organisation could support an apprentice, where they would fit in their initial learning and how their contribution would be billed etc. Other professions have done it (law for example), so why not chemical and process engineering. After all, isn't what we do all about solving problems?

WHAT NEXT?

If you'd like more information on how you/your company could include apprenticeships into your recruitment plans – here are some useful websites:

- https://www.instituteforapprenticeships.org/
- https://www.gov.uk/browse/education/find-course
- https://www.ucas.com/apprenticeships

Companies that are interested in investigating the opportunities that degree apprenticeships offer should contact universities to discuss.

School leavers looking to get on a degree apprenticeship need to either apply directly to companies of interest or via gov.uk[1] or UCAS[2], rather than direct to the universities themselves.

Currently there are only two universities offering the Science Industry Plant & Process Engineer course – Aston University in Birmingham and Teesside University in Middlesborough (launching in autumn). Aston offers a blended approach (combination of block learning and virtual), while Teesside's programme is completely virtual – meaning that both programmes can be accessed from anywhere in the country. ■

Deborah Darnell is regional engagement manager at IChemE focusing on technical, vocational, and sector development

REFERENCES

1. https://www.gov.uk/apply-apprenticeship
2. https://www.ucas.com/apprenticeships