

# Apprenticeships by degrees

**Steve Welch** talks to **Professor Steven Maggs** about WMG's range of full-time and part-time undergraduate and postgraduate degree apprenticeship courses in the engineering and technology sectors



**P**rofessor Steven Maggs is Director of Undergraduate Programmes at WMG, University of Warwick. As part of his diverse role at WMG, one of his key responsibilities includes leading the design and delivery of a number of degree apprenticeships, including the multi-company Applied Engineering Programme, BEng Engineering for Dyson, BSc Digital and Technology Solutions and BSc Digital Healthcare Science. Although less involved, he also supports the delivery of BSc Cyber Security.

Steven oversees full-time undergraduate courses delivered in collaboration with the School of Engineering at the University of Warwick, and also looks after programmes delivered at WMG's Degree Apprenticeship Centre (DAC), which opened its doors to apprentices in October 2019. In addition to chairing the Undergraduate Executive Committee, he is also a member of WMG's Operational Executive Group.

To support 14-18 year-olds and diversify the individuals that have opportunities to work in STEM-related careers, he was also involved in setting up the WMG Academy for Young Engineers. Now Deputy Chair of Governors he has assisted in setting a second WMG Academy for Young Engineers up in Solihull. Both Schools have now been rated as 'Good' by OFSTED.

**Steve Welch:** Could you tell me a little about your background in the sector?

**Steven Maggs:** My journey through to obtaining a professorship in the education sector began by completing a technician apprenticeship in Mechanical and Production Engineering at the Ministry of Defence. I'm a huge advocate for apprenticeships, as this provided a great platform for me to go on and study a Bachelor's Degree and PhD in Metallurgy at the University of Leeds, and eventually forge out a career at one of the best universities in the country.

Following my graduation, I worked in the aluminium industry and armoured fighting vehicle industry for around five years, before joining WMG at the University of Warwick in 1999 as a Senior Teaching Fellow, delivering Computer Aided Design (CAD) training courses.

Through being a Director of Undergraduate Programmes for the last three years, I have adapted to the

new world of degree apprenticeships. This includes adjusting to new funding regimes and compliance measurements as a result of the new UK Apprenticeship Levy, meaning that any company with a wage bill over £3m has to put 0.5% of the wage bill into an Apprenticeship Levy, which they can then draw back to pay for apprenticeships.

Throughout my career I have been actively involved in teaching and delivering programmes, particularly around the areas of Computer Aided Design (CAD), Engineering Materials and Manufacturing Technologies, and I now have the opportunity to shape new innovative programmes and mould the ways in which we encourage companies to engage with apprenticeships.

My role now focuses on shaping how our education offering is delivered, and my key focuses include our new Degree Apprenticeship Centre, our remodelling of the Applied Engineering Programme delivered with Principal Partner Jaguar Land Rover as well as a host of other companies, and expanding on the first three cohorts delivered on the BEng Engineering (for Dyson). I also help establish new industrial partners to deliver apprenticeships and help train individuals, upskill workforces and enhance prospects for individuals across a diverse range of social, economic and ethnic backgrounds.

**SW:** Could you provide a brief summary of the training/courses you

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Professor  
Steven Maggs



offer in the engineering and technology sectors?  
**SM:** At WMG, we offer a range of full-time and part-time undergraduate and postgraduate degree apprenticeship courses in the engineering and technology sectors, and many of these courses are now being delivered in our new Degree Apprenticeship Centre.  
 Our degree apprenticeships tend to be part-time as individuals need to spend time applying learning in the workplace, and are required to study here at the University at least 20% of their time. Our part-time undergraduate degree apprenticeship offering includes our BEng Applied Engineering Programme, BEng Engineering (for Dyson), BSc Digital Technology Solutions (Software Engineer), BSc Digital Technology Solutions (Network Engineer), BSc Digital Technology Solutions (Data Analyst) and BSc Digital Healthcare Science. From this breadth of training, individuals can also study a full-time undergraduate degree in BSc Cyber Security and BSc Digital Healthcare Science.  
 We also work in collaboration with

the School of Engineering to deliver three BEng and MEng full-time courses. As well as undergraduate, we offer a suite of postgraduate courses as degree apprenticeships including MSc Healthcare Operations Management, PGDip Post Graduate Engineer, MSc Managing in Technology Based Industry, MSc Supply Chain & Logistics Management and PGDip Systems Engineering Technical Leadership (GE). These courses sit alongside 15 full-time Master's programmes, attracting over 1,200 students from over 60 countries, and 13 part-time postgraduate options.  
**SW:** How are courses evolving to reflect new technologies?  
**SM:** We are re-writing our Applied Engineering Programme to ensure this stays updated with the latest trends and contemporary ways of working in the engineering and manufacturing industry such as 3D printing, AI, VR and IoT technologies. This involves shifting the focus of the course so that it includes more training on digital and software. We are now also seeing more of a crossover between our Applied

Engineering Programme and the different degrees we offer. We're seeing that there is a demand to incorporate AI, IoT and Robotics in all disciplines from Digital Technology Solutions through to Digital Healthcare Science.  
 Our Degree Apprenticeship Centre has provided an opportunity for us to bolster our courses with the equipment, learning environment and tools needed to deliver teaching in a "learning by doing" way. Having a purpose built dedicated facility for degree apprenticeships with a new flexible multi-purpose engineering lab including 15 3D Printers, a wind tunnel, materials testing, mechanical equipment, electronic engineering and collaborative spaces provides the flexibility to update, improve and rewrite programmes in response to industry trends.  
 As we are constantly reviewing the training and courses that we provide, working with some of the biggest and most successful companies in the UK provides a huge opportunity for us to uncover and question new technologies in the industry, and get to the root of where the priority areas are for



organisations from a skills, training and technology perspective.  
 Our strong industry connections also allow us to embed assessment methods that are as authentic as they can possibly be. Rather than contriving engineering examples, we can go directly to the business and integrate contemporary data sets, case studies and technologies directly within our programmes. This approach also ensures that we are providing individuals with relevant skills that they can apply in the workplace straight away.  
**SW:** Are there opportunities to work with industry when studying?  
**SM:** All of our degree apprenticeship students are in work as they learn, the courses require 20% off the job training and the rest of the time they are embedded in their respective organisations.  
 Our Degree Apprenticeship Centre has been launched to look less like a university and more like a corporate space. Given our focus on industry within this building, it's important that the quality and visuals of the facility are attractive and open enough to reveal what innovative teaching happens in

the building.  
 Focusing on creating an innovative learning environment, JLR has recently donated a Range Rover Evoque to the Degree Apprenticeship Centre, which students will be able to work on for digital engineering-based learning.  
 We currently work with a range of national and multi-national companies to deliver our undergraduate degree apprenticeships, including partnerships with Dyson, Lear, Aston Martin, Fanuc, GSK, Rolls Royce, Airbus, Caterpillar, JLR, Thales, Prodrive and TWI.  
 Similarly, we also work with high profile companies to maximise our postgraduate offering, including GE Aviation, Royal Mail, Amazon, BP, NHS, Stadco, Arqiva, ABB, Chamberlain Hill, Biffa Waste, Sellafield and CBRE.  
**SW:** How are engineering departments working with other departments to address issues facing manufacturing and productivity?  
**SM:** We are always looking for new opportunities to develop innovative courses that increase productivity and develop solutions for UK manufacturing. For example, we are supporting the transition to electrification

and autonomy in the automotive manufacturing sector through our range of digital technology courses.  
 When developing new courses, we always consult with other departments at the University of Warwick including the Medical School, School of Engineering and Department of Computer Science to design new course content and gather as much specialist knowledge in the digital, technology, engineering and health areas as possible.  
**SW:** Do you have examples of some courses and the content and methods of study?  
**SM:** Our Degree Apprenticeship Centre allows us to implement more problem-based learning throughout our portfolio of courses. We are moving towards methods that focus on learning by application, encouraging agile thinking in response to unforeseen problems, much like the ways of working in industry. Backed by the funding from the Local Enterprise Partnership, we're implementing flexible and versatile spaces such as the new engineering lab, which allows us to deliver this.  
 We're also putting more of a framework around the collaborative

and group aspects of the learning experience at WMG, with more structured assessments around softer skills in modules, such as interaction with colleagues and problem solving as a group.

Our innovative Digital Technology Solutions programme has been designed mainly for JLR in response to a relatively new role in the business. We have revamped the methods of study here, whereby degree apprentices study at WMG for three months full-time straight away. This is in contrast to the typical format where students' time is split between their employer and University straight away. This new format has been implemented with a view to providing the programming, mathematics and professional skills individuals need before they are initially immersed in the business.

However, the methods of study on this programme are flexible. For example, we also run the same programme for French multinational aerospace company Thales, but in a way that splits the contact time between the company and WMG right from the start. This suits the company as their UK base is in Crawley, meaning that it would be very costly to move all employees involved to WMG for an initial three-month period.

**SW:** What are your Reflections on 2018/2019 for your organisation and Engineering industry generally?

**SM:** Throughout 2018/19 we've seen that there's increasing emphasis from the engineering industry on digital technology and innovation. Whilst we're supporting this demand for digital technology skills, we're also emphasising that a degree apprenticeship is not just about what individuals are being taught in terms of technical content - softer skills have to be brought to the fore too. For example, individuals' behaviour, interaction with colleagues and general communication.

We're also seeing that degree apprenticeships are deemed a viable



solution for either new and emerging roles in an organisation, or for the roles that struggle to attract people.

**SW:** What do you see as the key trends over the next few years?

**SM:** We are envisaging that problem solving-based learning and continual lifelong development/upskilling are going to be brought further and further to the fore within the education sector over the next few years.

In addition, industrially we're seeing that there will be opportunities in the battery and energy sector, particularly as the automotive industry is focusing on electrification and autonomy solutions, which means that there will be huge portions of workforces that need to be upskilled. We believe that we can help alleviate these problems.

Given how we are embedding a multidisciplinary approach through our teaching, and how the Degree Apprenticeship Centre will be instrumental to drive this, we are seeing a shift from identifying engineering students as mechanical or automotive, to instead providing the underpinning foundations of engineering across the board and seeing engineering as more

of a generic discipline that provides the flexibility to specialise in a niche area later on.

**SW:** What are your goals looking ahead in 2020?

**SM:** We would like to reach 1,000 apprentices enrolled by the end of 2020, whilst offering more blended learning.

We will also be utilising 2020 as a period where we can work to redesign the Applied Engineering Programme as a degree apprenticeship to widen participation.

In addition to the fantastic work that has already been done up to this point, we'd like to enhance the pipeline of students at the WMG Academy for Young Engineers.

Utilising our existing portfolio, we'd also like to utilise 2020 as planning time to launch short courses based on what we currently deliver, whilst repackaging the digital and healthcare courses from the existing portfolio, with a focus on upskilling staff.

**SW:** What are the main challenges facing the education sector and for your establishment specifically?

**SM:** I think we are still experiencing an



imbalance between males and females in the engineering technology sector. We have a challenge to ensure that individuals across all genders and socio-economic backgrounds have an opportunity to be successful in this sector.

Another challenge we've identified is expanding the signifiers or criteria beyond A Levels results for individuals showing potential.

Furthermore, although our programmes are geared up to work well with large companies that send big cohorts of students, we also need to enhance our work with SMEs so that they understand their responsibilities if they employ apprentices.

**SW:** Do you have a message to schools/government on engineering education

**SM:** For schools, I'd encourage teachers, parents and peers to understand what the engineering and technology industry is and research how diverse, varied and stimulating studying or working in this area can be.

For Government – I urge the provision of policies that are needed to deliver flexible programmes. We don't want to make apprenticeships

so complex that companies walk away before they've even engaged. I'd also highlight the downward pressure on funding, and stress that the quality of the training can't suffer as a result of this.

**SW:** Why should students choose to study at your organisation?

**SM:** We are continually investing in our facilities to ensure they meet the requirements of industry, most recently demonstrated by the Degree Apprenticeship Centre. This is an environment that is designed to change the perception of an engineering apprenticeship from a traditional dark and grey workshop to a light, innovative space for technology driven future engineering. The building has a dedicated PC lab and a dedicated engineering lab, teaching spaces that expand and contract depending on the course or specialism being taught, and the apprentices transition from classroom to group working spaces during modules, which is designed to replicate the work environment and help develop the soft skills of open

plan professional behaviour.

Our links with industries across the world, our research-led approach and the wider University's reputation provides all the components needed to succeed both academically and professionally.

The University of Warwick was also one of the first Russell Group universities to support degree apprenticeships, so this has been a key focus for the institution for a number of years.

**SW:** What is your summarising message to our wider readership

**SM:** To potential apprentices, degree apprenticeships are a fantastic way of learning where you are paid to study. They're not necessarily for everyone and they're not an easy option. However, your speed to competence, work readiness and career prospects will improve massively as a result.

To employers, come and talk to us as we are keen to co-develop programmes that suit your needs and deliver employees with the knowledge, skills and behaviours you are looking for.

<https://warwick.ac.uk/fac/sci/wmg/education/degree-apprenticeships/>