UK DEGREE APPRENTICESHIPS
A YEAR IN REVIEW

A FOCUS ON THE DIGITAL & TECHNOLOGY SOLUTIONS PROFESSIONAL DEGREE APPRENTICESHIP AT MANCHESTER METROPOLITAN UNIVERSITY

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LIMITATIONS

This report represents one tertiary institute’s experience of the design and operation of Degree Apprenticeships. The author’s recommendations for ‘where to next?’ are formed from a synthesis of this experience and her earlier report ‘Stepping into one another’s world: Apprenticeships – Transforming engineering technologist education in New Zealand’. These recommendations are solely the author’s opinion and it is hoped will form the basis of wider discussion, which may eventuate in a Degree Apprenticeship pilot programme.
Background

In October 2013 the UK government published the implementation plan for delivering an apprenticeship reform in England. The method uses ‘Trailblazers projects’, which piloted over 2014/2015 and 2015/2016. Trailblazers are groups of employers, sometimes with professional bodies and universities, that develop an apprenticeship standard for a particular sector. One of the first pilot Trailblazer projects related to the digital industries sector; with the development of the Digital & Technology Solutions Professional Degree Apprenticeship that was launched in September 2015.

The Trailblazer project for this apprenticeship was led by the Tech Partnership. This body represents a network of employers that wish to create skills to accelerate the growth of the digital economy. They are recognised by the UK government as the Industrial Partnership for the Information Economy. They provided two facilitators to operate the Trailblazer project, one chaired the sessions and the other developed the apprenticeship standard. The companies that were involved in defining the apprenticeship standard are: Accenture, BT, BCS, CapGemini, Cisco, IBM, Microsoft, John Lewis, Lloyds, Ford, Chartered Institute for IT and the Test Factory. This group of employers have worked closely with a number of universities to ensure that the outcomes (in skills, knowledge and behaviour – specified in the apprentice standard) are demonstrated by completion of a new degree, called the BSc (Hons) in Digital & Technology Solutions. This qualification is nationally recognised through accredited educational providers and is transferable to other career paths and to higher forms of qualifications, i.e. Master’s degree. There have been seven universities involved in developing the degree, i.e. Aston University, University of Exeter, University of Greenwich, Loughborough University, Manchester Metropolitan University, University West England and University of Winchester. The degree is a ‘closed degree’ so only students that are apprentices (employed at companies) can enrol.

At Manchester Metropolitan University (MMU) the digital & technology solutions degree apprenticeship attracted 60 enrolments in September 2015 and another 60 in September 2016.

This report summarises discussions with MMU concerning their first year operating the digital & technology solutions degree apprenticeship.

Defining Degree Apprenticeship Standards

It is important that apprenticeships are scoped with an occupation in mind (i.e. usually applied to a role in a company) and it has worked well with developing degree apprenticeship (DA) standards for roles such as a software engineer, data analyst, web developer or IT consultant. MMU concur that defining the DA standard in two pages of outcome-based components (focused on skill, knowledge and behaviours) has been excellent; although noted it did take quite a lot of work to condense the initial 12 page document to 2 pages. Also, this programme is an integrated model and does not have a separate external end-point assessment (which other DAs have included), instead there is a final synoptic project in the final year of the apprenticeship.

They are now working on defining an apprenticeship standard at a Masterate level (NZQF level 8). They acknowledge that it has been significantly more challenging. For instance, to identify a specific role that a level 7 (UK Qualifications and Credit Framework) apprentice conducts, that is quite distinctive from a level 6 (UK Qualifications and Credit Framework) apprentice, is quite difficult. Hence the definition of a Masterate level apprenticeship standard is causing a few concerns for the government body who has to authorise the standards.
Process for Developing the Degree Apprenticeship Standards

Whilst this report is focused on the Digital & Technology Solutions apprenticeship (D&Tsolns) MMU has undergone several development processes to initiate a Legal Services Apprenticeship and a Chartered Manager Degree Apprenticeship. As MMU have undergone several iterations for developing apprenticeship standards they are in a fortunate place to be able to reflect on the current process. In summary MMU agree that the process used for developing standards has worked very well.

All DA standards follow a fixed path of development. Firstly an Expression of Interest (EoI) is generated which is quite high level and consists of a few pages. 10 companies must be in support of this EoI before the EoI is sent to central government for approval. This can take 2 or 3 iterations before the EoI gets approval by government. This is because the government wish to ensure that there isn’t overlap/duplication; is unique; is a relevance to industry; is good support from the industry sector and there are well defined roles. Once the EoI has been approved there is a sponsor or consortium of employers appointed (and for MMU’s D&Tsolns it was the Tech Partnership) which then pulls together a wider group (that includes the original 10 companies) to draw together the DA standard. This 2 page standard has learning outcomes but also how the assessment and quality will be managed. Once the consortium of employers, which has included involvement with the universities, has agreed the standard this then is sent to the government for final approval. Once approved that standard goes into the public domain (i.e. becomes property of the Crown) and is published on Gov.UK. This means that any university has access to the standard and may base a degree on that standard.

A key positive (concerning the process) in MMU’s view, is that the Tech Partnership has been extremely effective. They brought together the relevant parties, not just the industry players but also included the universities. The Tech Partnership had people who could “speak the university language” and also “speak the industry language”.

One expert in particular was very involved in developing the Skills Framework for the Information Age¹, which has become a common language for the skills and competencies required in the digital world. This person was extremely important as they bridged the gap between industry needs and educational wants.

The MMU team also discussed their dealings with operating the Chemical Science Technologist Higher Degree Apprentice. Whilst this isn’t specifically related to the D&Tsolns apprenticeship some of the concerns raised may be used as a lesson for developing degree apprenticeships in New Zealand. The Chemical Sciences Higher Degree Apprentice is at level 4 and 5 on the UK’s Qualifications and Credit Framework (equivalent to a level 6 on the NZQF). Cogent Skills, who have developed the standard, is the UK’s strategic body for skills in the science industries and is led by sector employers. MMU was working with Cogent Skills to deliver the Chemical Science Foundation Degree. A concern MMU have faced is that this apprenticeship has been developed with minimal involvement of the education sector. They also state that it is confusing for the student and parents as the standard maybe completed by studying several different levels of qualification. For example to complete the Chemical Science Technologist higher apprenticeship a student can take either a Foundation Degree in Chemical Science at Manchester Metropolitan University or the University of Hull or they can study a EDEXCEL BTEC Level 5 HND Diploma in Chemical Science for Industry awarded by Pearson Education Ltd.

It seems (from the interviewer’s point of view) that this apprenticeship standard has been developed by an employer sector body in isolation and that the educationalists are just seen as suppliers of knowledge qualifications. There seems a large divide between the employers and educators that isn’t conducive for developing better apprentices. MMU will continue to deliver this programme but try to ensure that it becomes a real ‘Degree Apprenticeship’ in the future.

Resourcing
A clear message from the interview is that support is crucial. The Director of Apprenticeship’s team had the support and buy-in from the senior levels of the university. For example the Dean of the Faculty of Business and Law and the Dean of the Faculty of Science and Engineering have strongly supported the development of DAs. Also the Deputy Vice Chancellor has provided university funding to put together the Apprenticeship Team (approximately 6 people) that solely supports strengthening MMU’s capability in developing and delivering DAs. They acknowledge that the initial setup is quite demanding of resources, particularly in building up relationships with employers. Also, the resource for recruiting students is demanding as they see they now have a “dual role” - not just recruiting students but also employers who provide the jobs. MMU emphasise that the role of going into schools to recruit students and also visit employers must be fully resourced.

Degree Apprenticeship Brand & Perceptions
It is recognised that the brand and image of DAs is extremely important for recruiting apprentices. MMU acknowledge that initially there were challenges breaking down students’, parents’ and employers’ pre-concieved perceptions about apprenticeships. This became apparent with regards to recruiting (students and employers) and hence it is important that the team recruiting is able to clearly articulate what is a DA. There are many types of work-integrated learning that are quite mainstream (e.g. internships, practicums, part-time degrees) so it’s important that the message is clear about the uniqueness of this type of work-integrated learning at a degree level. MMU stress that they needed focused support (people and marketing collateral) to communicate to students, parents, teachers, employers about what it is and how it’s delivered. For examples of the marketing collateral that MMU provides to employers refer to Appendices 1 to 6.

There are still challenges with how the DA is perceived, particularly with high decile schools. There have been examples where schools are actively discouraging their students to undertake a DA. The reason given is that schools now report on their students’ onward destinations, either employment or further study (universities) and parents are keen to see their school perform in the academic pathway rather than employment. If an 18 year old school leaver embarks on a DA, this is reported as employment, albeit the person is studying for a degree at a university. Also, it was highlighted that the government has only just started to be proactive in engaging with schools and careers advisors about the DA qualification and further work is needed to ensure that young people are advised of all their options.

Regarding students’ perceptions, there has been a positive change over the last year in the 18 year old school leavers’ perceptions associated with the DA. At first there was stigma attached that is was below the standard of a full-time degree. The 18 year old school leaver (that MMU are approaching currently for the 2016/17 offering) is now beginning to see the DA is a prestigious option with a lot of benefits. Also, MMU dual-badge the DA and they market it as such. This means that it is both an apprenticeship with paid employment and also a degree (BSc Hons).

Degree Apprentice Performance
Initial results concerning student performance is that the DAs mainly out-perform the full-time degree students.

A quote from a Head of Department, involved in teaching the DAs, said “we’ve seen the apprentices out perform on average full time students …….even if you took two people who were academically the same and put one through the DA, I think the apprenticeship route would encourage them to do better …. (it’s because) they can see why they’re learning this material and its context and they’ve also got that excellent work ethic”. MMU staff state that students’ believe that the company have a vested interest in them and want to prove that they’re worth that investment.

MMU report to employers about absenteeism. They currently have a 100% attendance record (other than sickness, etc), which is almost unheard of in the full-time equivalent degree cohort.

Employer Engagement
In the first cohort there are 11 employers that have, between them, taken on 60 D&Tsolns DAs. The employers range in size from large (Barclays, AstraZeneca, Lloyds and Thales) to regional SMEs such as Reality Mine (90 employees), Shaping Cloud (not known) and MC2 (not known).
25 DAs have taken the Software Engineer pathway and 35 DAs have taken the Business Technology pathway. The female:male split is 26:34 DAs i.e. 40% female, which is high for Computer Science. There is a mixture of school leavers and current employees that are being up-skilled by their employer.

On the whole all employers have remained supportive of the DAs to quote “by enlarge employers are pleased and impressed with people they’ve got”. Only one company (who became bankrupt) has left the scheme. Unfortunately this has affected 4 apprentices – 3 have secured other employers to support their apprenticeship and it seems the other apprentice will switch to the full-time course. The implications to MMU is that they haven’t been funded for these students. This is due to the current system in that the government will not pay providers until the employer has paid their contribution. As this company was liquidated MMU didn’t receive any payments. On reflection MMU admitted that their process for due diligence was lacking on this particular company, and is in part due to that the company was a referral by another Faculty within MMU.

MMU are also working with another company that have also been problematic throughout the year. They were initially reluctant to work with this company as it was paying the Apprenticeship Minimum Wage (GBP 6k per annum); it was not discussed why they did pursue the relationship despite the reluctancy. Due to this experience MMU have decided to only work with employers that pay a minimum of GBP 12k p.a. That said many of the DAs that work for larger organisations are getting a salary of GBP 18-21k.

MMU have learnt much from brokering dealings with companies and they have also a more careful due diligence and credit assurance policy. For example they’ve discovered that if a company has more temporary staff (e.g. interns, contractors, apprentices) than permanent employees it is an indicator of inability to support apprentices.

Working with SMEs

MMU have had many dealing with SMEs. The following are key elements they believe are crucial for SMEs to succeed with employing DAs:

**STRUCTURE FOR MENTORING AND EMPLOYEE DEVELOPMENT**

Apprentices only work if the company has someone more senior who can mentor the apprentice. A crucial issue MMU commonly see is enquiries from companies that can’t provide a mentor role. That said, there was some discussion about the pros and cons of mentoring in large vs small organisations. In some SMEs the apprentice sits next to their mentor and so learning is much more subliminal and can be quite a positive experience, as opposed to a larger organisation where the mentor is situated in a different physical space. Another positive MMU has seen (dealing with SMEs) is that the projects the DA gets exposure to are relatively small so they are involved from beginning to end and they also see projects that are going to happen within 3 to 6 months, i.e. they see a whole spectrum of activities. Whereas in a much larger organisation the DAs are a small part of a large team and their day-to-day experience can be very narrow and ‘niche’.

Many SMEs haven’t previously employed an apprentice. They do not have much idea about the time commitment needed to support the DA. MMU have responded to this by providing a ½ day training course on supervisory/mentor support at the beginning of the D&Tsolns programme. MMU are currently investigating expanding this training to more than ½ day.

NB: MMU have come across small companies that see the DA as giving them the experience they require in their organisation without actually having the expertise in that specific area. Some companies may see DAs as a cheaper alternative to paying someone with the expertise. In these cases MMU have turned them away.

**GIVING APPRENTICES OFF-THE-JOB TIME**

Many SMEs enquire about the time the apprentice needs to study (course work) and be away from their business. MMU suggest ½ day per week in their job to support study. This is in addition to the 1 day per week (30 days per year) a DA spends at MMU. That said, this depends totally on the company. Some organisations can be quite inflexible and state that, other than a DAs day-release at MMU, any other study must be conducted in their own time.
MINIMAL DEMANDS PLACED ON SME COMPANIES

Generally the SME companies MMU have dealt with have met their obligations (mentoring, etc.). This is mainly due to getting a SME to fully understand their commitments at the beginning of the DA. MMU have worked hard in explaining to companies what their obligations are and formulating a Service Level Agreement.

MMU have purposely not overloaded the companies with demands. For instance, companies only have involvement with the assessments when they specifically choose to. Whilst there is an expectation that a company supports the DA in helping them complete an assessment (for example it could be directing a DA to speak to the correct person or access the right database, etc. so that they can obtain information to complete their assignment) this is deemed minimal. However, an employer’s main involvement is with project work and the e-portfolio.

With regards to project work it would be expected that the company sends a representative(s) to attend a presentation by the DA.

DAs also have to develop an e-portfolio of their work throughout the apprenticeship. It is expected that the company mentor periodically looks at the e-portfolio with the University Reviewer and the student and comment in terms of progress, future direction (personal development) and (importantly from MMU’s point of view) confirm that it is the DAs work and accurately shows the DAs level of contribution to the work. Whilst it is still early days, this portfolio is seen as quite an important part of the DAs work. It should tie closely to the DAs personal development, objective setting and review but also it could be used internally (at the DAs company) as evidence of what they’ve done.

ASSESSMENTS WITH POSITIVE IMPACT ON A BUSINESS

One of the interviewees who has experience with setting assessments for work-based students said “they’ve (student) ended up with an assessment/report that the business can benefit from too”. In addition, it was discussed that SMEs probably benefit more than they think from assessments, as they tend to not have time to either focus on a particular area or have an opportunity to get a different perspective on something – i.e. the DA is allowing their company (by studying a certain aspect through an assessment) to step back and challenge what they currently do.

To support this, MMU do have Assessment Regulations where they have a blanket policy whereby any employer can suggest an alternative assessment, as long as it’s deemed equivalent in learning outcomes. This benefits the company and also enables a DA to ‘double up’ on what’s happening in their workplace. MMU’s view is that employers are not very confident about doing this at the present time.

Employer Driven Future Developments

MMU is based in central Manchester. Manchester is building its reputation as a hub for digital and creative businesses. For example in June 2016 Manchester City Council announced plans for GBP 5.3m hub for such businesses. It is also known as MediaCity UK (at nearby Salford) where the BBC and ITV are housed.

It is apparent that MMU’s reputation for successfully delivering DAs is getting out to industry. MMU have been approached by employers to help them develop a DA in Digital Marketing and UX. This is directly driven by skills gaps in this particular area.

Testimonials

THE APPRENTICES

The following YouTube clips highlight the positives experienced by the apprentices. This is typically - the excellent support, seeing immediately what they’ve learnt in practice and getting paid whilst getting a degree.

Degree Apprentice – Siobhan Holden (Barclays)
https://youtu.be/bwXppLVq-WM

Degree Apprentice – Ryan Coram (AstraZenica)
https://youtu.be/zBvmHbl_4FY

Degree Apprentice – Charley Denny (AstraZenica)
https://youtu.be/FqUBNJeN_EE

Degree Apprentices - other testimonials
https://youtu.be/sByf_b80hxo
THE EMPLOYERS

It was not possible for the interviewer to speak directly with any employers. Employers views concerning the DA programme were discussed and in general employers are happy with what is happening. The interviewer was referred to an article which should be regarded as representative of what employers think about DAs.

The article highlights the views of two employers (one large and a SME). Both consider that the DA meets recruitment needs in ways that other options do not. They particularly value the ability of apprentices to make an immediate contribution in the workplace and stress the value of a learning programme tailored closely to business needs. For the smaller employer the support services (such as marketing for recruitment) offered by the university are a significant advantage. Building trust between employers and the University is crucial and such initiatives as the pre-validation Advisory Board help employers engage with the process of developing and shaping course content. Both employers see investing in the DA as excellent value for money and less favourable government funding in the future would be unlikely to deter them from employing degree apprentices.

THE UNIVERSITY

MMU endorse the DA programme and have set up a dedicated team to support the growth of DAs at the university. MMU see it as a way to increase employer engagement and external PR, allows the university to keep pace of rapidly evolving areas. However, they concede that it’s highly complex to establish and manage and there are risks involved.

The Apprenticeship Levy

Whilst not discussed during the interview, the new apprenticeship levy will have a significant impact on businesses employing apprentices. In April 2017 the UK Government will be requiring organisations that have a payroll of £3 million to make a payment of 0.5% of any staff costs above this threshold. This levy payment will then be held in an account and available for organisations to spend on accredited apprenticeship programmes within an 18-month period.

Any levy contributions remaining unused at the end of the qualifying period will be used more generally to fund apprenticeships. The Government has proposed that employers that are too small to pay the levy (around 98% of employers in England) will have 90% of the costs of training paid for by the government. For a summary refer to the document in Appendix 7.

Conclusions

These conclusions have been formed solely from the experience of the MMU DA programme described above.

- The newly launched digital and technology solutions degree apprenticeship (DA) has generated much interest from employers and has resulted in buoyant enrolments, i.e. obtaining 60 apprentices per year.
- DAs must be scoped with an occupation in mind and directly driven by a skill gap in a particular area.
- DA standards must be developed with a potential for the apprentice to advance in continuing professional development, i.e. stair-casing to higher qualifications.
- The Trailblazer process for specifying DA standards is extremely powerful in getting employers, educators and professional bodies to collaborate. The involvement of employers and educators and their facilitation is crucial to success.
- Once an apprenticeship standard has been agreed it is beneficial that the academic qualification contained within the standard is the same qualification, although it may be offered by different academic institutions.
- Resourcing academic institutions is crucial, particularly in recruitment, brokering with employers and developing curriculum and assessment.

Initial indicators is that DAs are becoming to be viewed as a viable alternative to obtaining a degree for school leavers. However, there still is a poor perception of what degree apprenticeships are and a misconception that these degrees are ‘lower level’ than the full-time equivalent; targeted publicity and having dedicated recruitment staff seem to be breaking down these perceptions.

Current apprentices are enjoying the programme, particularly how they can see theory immediately relating to their job. The performance of DAs are, on average, out-performing the standard ‘full-time’ cohort of students.

Employers are impressed by the apprentices they’ve received and early indicators suggest that employers see DAs as excellent value for money.

Universities that broker the recruitment of the apprentices and deal direct with the employers are seen as crucial support, especially to SMEs. A careful due diligence policy is essential to ensure employer support.

Companies that have employer mentors and also allowing an apprentice time to attend university (typically 1 day per week) with additional study time are critical. Without such support an apprenticeship shouldn’t happen.

Effective two-way dialogue between the university and employer is necessary to ensure the curriculum responds in a fast changing business environment and having methods to enable this (such as Advisory Boards) is crucial.

With the introduction of the apprenticeship levy in April 2017, employer engagement may well increase.

Where to Next?

It is quite apparent that the degree apprenticeship is a viable learning option for up-skilling New Zealand’s workforce and that a pilot should be conducted. It is important that we scope out this pilot stage and it is suggested to focus on a part of the engineering sector that requires specific skills that are currently or predicted to be in short supply and are of a degree level standard (i.e. NZQF level 7 qualification).

For New Zealand to embed this option we firstly need to get employers on board that will employ the apprentices. We can obtain employer engagement through two ways:

1. approach employers that have an urgent need for a particular skill
2. provide funding to support the programme

ADDRESS SKILLS SHORTAGE

To help scope out the pilot we need to identify a particular skill shortage in the engineering sector that requires a blend of degree level of knowledge and vocational skill, competency and behaviour. For example, it may be a site engineer in the infrastructure/construction industry.

It is suggested that we use a similar process to the UK’s Trailblazers. Firstly we need to approach the sector or sectors and identify the employer group that would willing to lead the development of an apprenticeship. The employer group must be representative of the sector. The group must have a wide range of employers, meaning at least 10 employers (in addition to any participating professional bodies, trade associations, etc.) would wish to be involved with developing a new Degree Apprenticeship (DA) Standard for that particular occupation.

These employers are reflective of those who employ people in this occupation, including in terms of size and sector or sectors. [NB: if the pilot was to develop an occupation that spans sectors such as a software engineer, we would expect to see employers from other sectors such as retail, healthcare, IT services, government & defence].

Representatives from the Institutes of Technology and Polytechnics (ITPs), both Metro Group and regional, must be part of this group. It is hoped at least two ITPs will wish to be involved in specifying the Standard. Depending on the occupation it may be deemed beneficial to involve other providers within the tertiary education system that may offer complementary, specialised resources (expertise and/or equipment).

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The group must be willing to work inclusively and collaboratively and whilst one of the aims for this apprenticeship is to specify a degree level qualification (whether new or existing) the tertiary providers must not lead the process, as stated in the UK Government’s document:

“All other organisations involved, such as sector or trade bodies, professional bodies, training/education providers have been invited to support the process by the employer leads rather than leading the process themselves.”

A chair will need to be appointed. This will be an employer member that has been chosen by the group. To support the chair someone will need to be appointed that will be responsible for writing the DA Standard. This person should have both knowledge of the pilot sector and also knowledge of academic learning and assessment.

This group would be charged in developing a Standard and a subsequent Assessment Plan and may follow a similar process as suggested by the UK Government. These would then be sent out to a wider group of employers for feedback, prior to approval. Refer to the examples [Appendices 8-12] that have been developed in the UK, which provide an idea of the depth and breadth the Standard and Assessment Plan may include. Note: these examples are all at NZQF Level 7 standards.

Depending on the skill/sector that is part of the pilot - the group of employers, in discussion with the tertiary education providers, may deem that a current qualification (e.g. in Civil Engineering) maybe suitable to help meet that particular apprenticeship Standard (e.g. in Civil Engineering Site Management). If not, it would be the group’s remit to develop a new qualification or modify an existing qualification that would meet the needs of that particular apprenticeship Standard.

The crucial issue is to get employers leading this process with the support from the tertiary education providers, professional bodies and sector bodies.

**FUNDING**

Prior to setting up the above process it is important that the funding is agreed upon. Without this being clear it will certainly provide barriers to employer engagement, particularly with the smaller organisation. The author cannot comment on how to fund such an initiative but advises that any funding procedure and its scalability needs to be clearly thought through in how to fund other DAs in other skills and sectors, prior to the funding of the pilot.

It is envisaged that if employers are an integral part of a Standard’s development and will also obtain Government funding support they will begin to employ Degree Apprentices. This then subsequently leads to an increase of skilled labour, that addresses specific skill shortages at the appropriate educational level.
APPENDICES

Appendix 1
Employers Guide: Degree Apprenticeship in Digital & Technology Solutions
Employers Guide

Degree Apprenticeship in Digital & Technology Solutions
Degree Apprenticeship in Digital & Technology Solutions

The Degree Apprenticeship in Digital & Technology Solutions is an industry driven and government supported approach, which will enable businesses to develop their own graduate-level employees in this area of skills shortages. Apprentices will work full-time with their employer, while studying towards a BSc (Hons) in Digital & Technology Solutions at Manchester Metropolitan University’s £75 million Business School.

What is it?

It’s a new work-based degree programme, bringing honours level education into the workplace context.

Our Digital & Technology Solutions Degree Apprenticeship, has been designed by major employers, a group of leading universities, and endorsed by the Tech Partnership, to meet the skills gap in IT.

Integrating academic learning at degree level and on-the-job practical training will enable apprentices to become confident, competent and capable independent Digital & Technology Solutions Professionals in a range of roles. The Degree Apprenticeship is suited to those looking to begin or develop a career in a variety of roles, including:

- Software Engineer
- Business Analyst
- Data Analyst
- Cyber Security
- IT Consultant
- IT Project Manager
- Web Developer
- Technical Sales
- Mobile App developer
- Technical Support

We also place a strong emphasis on developing reflective practitioners - young professionals who can plan and manage their own future careers.

How does it work?

Apprentices will be members of your team, learning and gaining experience of how you operate, your systems and culture. A holistic learning environment is created by combining workplace training with a programme of education designed to meet employers needs now and in the future.

Apprentices study a core curriculum, focused on IT and business, and includes a blend of digital, technology, business, project and transferable skills. There will also be a choice of pathways you can choose to meet your business requirements, including:

- Business Technology
- Software Engineering
- Data Analyst
- Cyber Security

The core units comprise around 60% of the programme and include the following topics:

- Introduction to Business Systems
- Introduction to Programming
- Introduction to Web Development
- Computing Fundamentals
- Technology Management
- Synoptic Project
- Portfolio

In addition the Software Engineering route will include:
Advanced Programming  
Computer Network and Operating Systems  
Development Project  
Enterprise Programming

In addition the **Business Technology** route will include:

- Applied Web Design & Development  
- Customer Information Management  
- Technical Business Consultancy Project  
- Business Intelligence & Strategy

The **Data Analyst** and **Cyber Security** routes will also include four specialist units.

Elective units include: UX Design, Digital & Social Media, Mobile App Development, Advanced Web Development, Data Engineering, Developing a Digital Business, Business Analytics, Entrepreneurial Practice

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**Your benefits**

Students develop skills and knowledge that are directly relevant to your business.

- A package of study and work that attracts enthusiastic and talented students/employees in this rapidly developing area.  
- Assessments tailored to the work your student is involved in.  
- Attracts new talent into your business and gives you the opportunity to 'grow your own' staff instilling your business culture and working style from an early stage.  
- Can also offer current employees the opportunity to develop their skills and obtain an Honours Degree in Digital & Technology Solutions.  
- Utilise government funding to retain and prepare your staff for a significant future within your organisation, by gaining internationally recognised qualifications.  
- Develop a working partnership with Manchester Metropolitan University.

---

**Your commitment**

Your role will be to extend the learning beyond the classroom, by giving apprentices a varied work programme, which allows them the opportunity to turn theory into practice, develop skills relevant to your organisation and achieve outputs with real business value.

Apprentices are employees and as such are subject to the usual terms of employment. We expect apprentices to be offered a minimum salary of around £12,000pa, although many organisations pay significantly more.

---

"Ensure your employees have the skills you need, by guiding their degree-level education in your own workplace."

You have full control over recruitment. The University can assist you with to promote your vacancies and will need to verify eligibility, for example, entry qualifications.

You will need to design a flexible work schedule, which allows time to study and attend the University for approximately 24 days each year, one day per week during university term-time. There will be two longer sessions - one during induction and another at the end of the academic year.

You will need to provide a mentor/line manager who will oversee the work and development of the student and who can coordinate projects and learning with the university tutor.

**When does it start?**

Recruitment and applications: January - June  
Enrolment: September

**Fees and incentives**

The Government has committed to paying **two-thirds of the cost** of any tuition fees for students studying for a Degree Apprenticeship. Other incentives currently available are:

- SME (fewer than 50 employees): £2,700  
- If you enrol an employee under 19 years of age: £5,400  
- On successful completion: £2,700

**Register your interest**

If you would like further information about the Degree Apprenticeship please contact us using the website below:

[www.mmu.ac.uk/apprenticeships](http://www.mmu.ac.uk/apprenticeships)
Key Questions Answered

How long does it take?
This is a four year programme.

What is studied?
The programme comprises 60% core modules plus a range of options that will allow employers to tailor the skills and knowledge acquired to match their business. Students will also undertake projects that will be based on work specified by the employer.

Who is eligible to apply?
Direct entry from school or college will require 3 A levels or equivalent at grade BBC or above. For those in relevant work, suitability is assessed on an individual basis.

Can existing employees apply?
Yes. As long as they meet the entry requirements or have suitable work experience they can apply for the programme.

Do degree apprentices work when the university is in recess?
Yes. Degree apprentices are employed by their employer and perform duties in accordance with the employers’ needs as with all apprenticeships.

For a full list of FAQs please visit: www.mmu.ac.uk/apprenticeships

Contact

Liz Gorb
Higher Level Apprenticeships Manager
e.gorb@mmu.ac.uk
+44 (0) 161 247 3728

Centre for Enterprise
MMU Business School
All Saints Campus
Oxford Road
Manchester
M15 6BH
United Kingdom

www.mmu.ac.uk/apprenticeships
Appendix 2
First Year Review:
Degree Apprenticeship in Digital & Technology Solutions
First Year Review

In October 2015, 60 of the UK’s first Degree Apprentices started on the Digital & Technology Solutions programme. Leading firms, including Barclays, AstraZeneca, Lloyds and Thales, and regional SMEs, such as Reality Mine, Shaping Cloud and MC2 were among the first to enrol students. The Degree Apprenticeship integrates academic learning with work-based training, to help develop employees with digital and technical IT skills that are directly relevant to employers.

Degree Apprenticeship in Digital & Technology Solutions

The Degree Apprenticeship in Digital & Technology Solutions has enjoyed a successful first few months, with feedback from students and employer partners being overwhelmingly positive. In 2015 the team at Manchester Met, along with an Advisory Board of employers worked hard to create a curriculum, that would meet the needs of businesses trying to fill skills gaps in this growing sector.

The organisations with apprentices studying at Manchester Met, have been hugely impressed with the progress so far and will be adding to their pool of apprentices in 2016.

The Government have re-affirmed their commitment to funding two-thirds of student tuition fees and also to a range of other incentives, that can reduce the cost even further. The programme will also be eligible for those businesses affected by the apprenticeship levy in 2017.

Work is underway to expand the offering from Manchester Met to meet business demands. Two new pathways will be available from September 2016 - Cyber Security and Data Analytics, as well as the Business Technology and Software Engineering options.

Get Involved in 2016

We are looking for more employer partners for our 2016 programme. Please get in touch to find out how we can make the apprenticeship work for your business:

@ digitalapprentice@mmu.ac.uk
0161 247 6043
www.mmu.ac.uk/apprenticeships

“60”
26 females
34 males

Pathways
25 Software Engineer
35 Business Technology
11 Employers

“The apprentices have settled right into their software teams and are already being amazingly productive.”
Phil Flynn, Thales UK

“Our apprentices love being on the degree course at MMU. They are really excelling, it’s stretching and challenging them, and they are really motivated to do well.”
Claire Findlay, Barclays

“I really want to prove to my company that they are doing the right thing in investing in me”
Amy Hawkyard, AstraZeneca Apprentice

Manchester Metropolitan University
Appendix 3
Digital & Technology Solutions
Degree Apprenticeship: Course Structure and Pathway Modules
# Digital & Technology Solutions Degree Apprenticeship

## Course Structure and Pathway Modules

### Year One (All core modules)

- **Introduction to Programming**
  - Developing structured problem solutions in Java

- **Introduction to Business Systems**
  - Including use of Excel & Access

- **Introduction to Web Development**
  - Building static web pages using HTML, Javascript & CSS

### Communication Skills Workshops - Team Building, Communicating, Value Building Behaviours, Diversity

### Year Two (Two core modules, one pathway module)

- **Computing Fundamentals**
  - Databases, SQL, simple networking & security

- **Software Engineer**
  - Advanced Programming
    - Advanced Java, support tools and linking to other software

- **Business Technology**
  - Customer Relationship Management
    - Using information to drive support and marketing

- **Data Analytics**
  - Statistics and Visualisation
    - Simple statistical analysis and use of software packages to present information graphically

- **Cyber Security**
  - Computer Security Fundamentals
    - Pre-requisite technical and practical skills for future units on the Cyber Security pathway

### Year Three (Three pathway modules)

- **Software Engineer**
  - Computer Networks and Operating Systems

- **Business Technology**
  - Web Design and Development
    - Dynamic pages, scripting, backend databases & UX

- **Data Analytics**
  - Advanced Databases
    - Schemas, advanced queries, relational algebra, interfaces with other environments

- **Cyber Security**
  - Computer Networks and Operating Systems

### Year Four (Two core modules, one pathway module)

- **Synoptic Project**
  - Used to demonstrate full range of learning across degree

- **Software Engineer**
  - Elective - Choice of:

- **Business Technology**
  - Elective - Choice of:
    - Developing A Digital Business, Digital & Social Media Marketing, Principles of Business Analytics, Entrepreneurial Practice, UX

- **Data Analytics**
  - Elective - Choice of:
    - Advanced Web Development, Digital & Social Media Marketing, Business Intelligence & Strategy, UX

- **Cyber Security**
  - Elective - Choice of:
    - Data Engineering, Mobile App Development, Advanced Web Development, Web Content Management, Systems, Digital & Social Media Marketing, UX

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[www.mmu.ac.uk/apprenticeships](http://www.mmu.ac.uk/apprenticeships)

The information in this document reflects the programme details as they are at the time of publication and is subject to change.
Appendix 4

Employers Guide:
Chartered Manager Degree
Apprenticeship with a BA(Hons)
Business Management Professional
A guide for employers to enrol new and existing employees at Manchester Metropolitan University from September 2016

Our Degree Apprenticeship has been developed to help employers who wish to:

- Combine workplace training with a programme of education designed to meet business needs, now and in the future
- Develop the management skills of their own employees
- Connect with a leading university, distinctive for its focus on professional development and accreditations
- Utilise advantageous government funding.
What is the Chartered Manager Degree Apprenticeship?

The Chartered Manager Degree Apprenticeship is a new industry-driven and government-supported approach for employee education. It is an innovative work-based degree programme, bringing honours' level education into the workplace context.

The Chartered Manager Degree Apprenticeship framework has been designed by major employers, representatives of the Association of Business Schools (ABS) and the Chartered Management Institute, to meet the skills gap and to improve and professionalise management and leadership in the UK.

Manchester Metropolitan University is endorsed by the Skills Funding Agency to deliver the programme, and apprentices will graduate with a BA (Hons) Business Management Professional. A core strength of Manchester Met’s business management teaching is its capability to design and teach a contemporary business curriculum, enabling students to apply critical modes of enquiry to everyday and strategic business issues. Manchester Met’s business teaching, research and impact on practice is internationally-recognised through its professional accreditations, student satisfaction results and by the quality of its academic, research-active staff.

Integrating academic learning at degree level and on-the-job practical learning will enable participants to develop as confident and capable management professionals in your organisation. The Degree Apprenticeship is suited to those looking to begin or develop a career in a variety of roles, including:

- Manager
- Senior Manager
- Head of Department
- Operations Manager
- Any other role with significant managerial responsibilities.

We also place a strong emphasis on developing reflective practitioners - professionals who can plan and manage their own future careers.

How does the apprenticeship work?

Degree apprentices work full-time with their employer, while studying towards a BA (Hons) Business Management Professional at Manchester Metropolitan University’s Manchester or Cheshire campuses. Successful graduates will also earn full CMI Chartered Manager status.

Students study a core curriculum across four years and attend approximately 24 teaching days per year on block release of two to four days. Core and industry-specific units directly support work-based projects, which offers the opportunity to apply learning directly to an organisation and its business context.

The programme is flexible so that employers and apprentices can choose elements that are best suited to meet local business requirements. The business projects, negotiated with employers, offer students the opportunity to apply their learning directly to their organisation and its business context.

Employer benefits

- Graduates, both existing staff and new employees you appoint, will develop skills and knowledge that are directly relevant to solving every-day and strategic business issues
- We know from experience that it is the package of study at Manchester Met combined with a job or work experience that attracts enthusiastic and talented students/employees in this area of skills shortages
- Degree assessments are negotiated with the business and tailored to the work of your employee
- Through the Degree Apprenticeship programme
Course Structure - BA (Hons) Business Management Professional

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Units</td>
<td>Industry Sector Specific Units</td>
<td>Company Focused Units</td>
<td></td>
</tr>
<tr>
<td>Managing and Leading People</td>
<td>Dynamic Business Context</td>
<td>Negotiated Business Project 1 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Finance and Accounting for Managers</td>
<td>Sales and Marketing</td>
<td>Negotiated Business Project 2 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>Operations Management</td>
<td>Negotiated Business Project 3 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Emerging Technology</td>
<td>Strategy, Leadership and Ethics</td>
<td>Business Portfolio</td>
<td></td>
</tr>
</tbody>
</table>

Added Value from Manchester Metropolitan University

At no additional cost - Manchester Metropolitan University’s Chartered Manager Degree Apprenticeship incorporates the CMI Level 5 Diploma in Leadership and Management. The level 5 diploma, awarded at the end of the third year, offers students an interim award and is in addition to the CMI Chartered status and a BA (Hons) degree awarded at the end of year 4.

you are eligible to utilise preferential government funding and incentives to retain and prepare your staff for a significant future within your organisation. From March 2017 there will be an apprenticeship levy payable by organisations with a payroll bill of over £3m per annum. It is calculated upon the size of the company and the earnings of its employees – regardless of whether an employer decides to take on an apprentice or not.

- A knowledge exchange partnership with Manchester Met is a long-term relationship that has multiple benefits for each party.

Employer engagement with the apprenticeship

- Employers enter into a knowledge partnership with the University. Manchester Met delivers a challenging business curriculum. Employers play a vital role to extend the learning beyond the classroom. This is achieved by giving apprentices a work programme, which allows them the opportunity to turn theory into practice, develop skills relevant to your organisation and achieve outputs with real business value.

- Apprentices are employees and, as such, are subject to usual terms of employment. They are protected by a national minimum wage but in order to attract and retain good quality candidates we strongly recommend offering a competitive salary.

- You have full control over recruitment. The University can work alongside you to promote your upcoming vacancies, assess candidates and to verify eligibility to enrol existing employees, for example, entry qualifications.

- You will need to design a flexible work schedule, which allows time to study and attend the University for approximately 24 days per year. The learning will be organised in such a way to minimise disruption to your work schedule. Distance learning will also be a feature of this programme and degree apprentices have full access to outstanding electronic and physical library facilities.

- Apprentices require a workplace mentor who will oversee their development and coordinate projects and learning with the University tutor. Manchester Met provide a popular, certificated one-day workplace mentor induction programme at the start of the apprenticeship.

When does the apprenticeship start?

Apprentice enrolment and induction takes place in September 2016. Employer recruitment should start as early in the year as possible in order to attract the best candidates and so that current employees can plan their time effectively. Applications can be received from May 2016.

Tuition fees and subsidies

The Government has committed to paying two-thirds of the cost of any tuition fees for students studying for a Degree Apprenticeship. Other incentives currently available are:

- SME (fewer than 50 employees): £2,700
- If you enrol an employee under 19 years of age: £5,400
- On successful completion: £2,700

Find out more

Visit our website below or contact us on the details overleaf to book a professional discussion.

www.mmu.ac.uk/apprenticeships
Key Questions Answered

Who is eligible to apply?
Direct entry from school or college will require a minimum of 260 UCAS tariff points at A2 or equivalent (such as DMM on BTEC Extended Diploma). For those in relevant work, suitability is assessed on an individual basis.

Can existing employees apply?
Yes. As long as they meet the entry requirements or have suitable work experience they can apply for the programme. There is no age limit.

How many degree apprentices will Manchester Met accept from each organisation in 2016/17?
There is no minimum or upper limit for the number of apprentices that can be enrolled from each company.

When does the apprenticeship levy scheme come into effect?
The employer levy scheme takes effect from March 2017.

When is tuition fee payment due by employers?
Employers pay their contribution towards the students’ tuition fees annually, at the beginning of each academic year.

Do degree apprentices have to work within the local area?
No. Manchester Met provides a flexible programme of study, making the programme accessible to degree apprentices throughout England.

Do Degree apprentices work when the University is in recess?
Yes. Degree apprentices are full-time employees and perform duties in accordance with the employers’ needs as with all apprenticeships.

For more information please visit: www.mmu.ac.uk/apprenticeships

Contact

Liz Gorb
Apprenticeships Director
e.gorb@mmu.ac.uk
+44 (0) 161 247 3728

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United Kingdom

www.mmu.ac.uk/apprenticeships
Appendix 5
Chartered Manager Degree Apprenticeship
Hospitality Pathway
The new Chartered Manager Degree Apprenticeship is an innovative
work-based degree programme, bringing honours level education into the
workplace. The Hospitality pathway has been designed, in consultation
with leading and innovative hospitality businesses to support the needs of
the industry and key sectors, and prepare apprentices for a management
career.

The apprenticeship, incorporating the BA Business Management
Professional with Hospitality, will develop students' knowledge, skills and
personal qualities necessary for effective performance within the
hospitality industry. Integrating academic learning at degree level and on-
the-job practical training will enable apprentice managers to become
confident, competent and capable independent management professionals
in a range of operational and management roles.

The focus of this new programme is to provide students with an exciting
and absorbing learning experience by combining academic theory,
contemporary industry knowledge and practical management experience.
Experts from the University’s Department of Food and Tourism
Management and the Business School embed an industry focus within the
programmes design, delivery and assessment methods.

The flexible programme is suited to a variety of hospitality workplaces and
will allow apprentices the opportunity to experience a broad range of
skills, competences and behaviours.

**Course Structure - BA (Hons) Business Management Professional**

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
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<td>Core Units</td>
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<td>Company Focused Units</td>
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</tr>
<tr>
<td>Managing and Leading People</td>
<td>Hospitality Dynamic Business Context</td>
<td>Negotiated Business Project 1 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Finance and Accounting for Managers</td>
<td>Hospitality Sales and Marketing</td>
<td>Negotiated Business Project 2 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>Hospitality Operations Management</td>
<td>Negotiated Business Project 3 (Work Based Project)</td>
<td></td>
</tr>
<tr>
<td>Emerging Technology</td>
<td>Leading Strategically and Ethically in Hospitality</td>
<td>Business Portfolio</td>
<td></td>
</tr>
</tbody>
</table>
The assessment strategy is designed around industry-based experiential learning opportunities using a range of work-based projects and a final year industry research project, giving apprentices an insight into the real-life challenges that occur in the hospitality work environment.

The degree also offers a range of industry-based short courses to support operational knowledge and competencies within the workplace and the CMI L5 Diploma qualification, all provided at no additional cost when studying at MMU. These professionally recognised qualifications will further enhance your apprentices’ credentials and network with key contacts from the hospitality industry.

Your benefits

- Utilise government funding to retain and prepare your staff for a significant future within your organisation, by gaining internationally recognised qualifications.
- Apprentices develop skills and knowledge that are directly relevant to your business.
- A package of study and work that attracts new enthusiastic and talented students/employees in this area of skills shortages.
- Assessments are negotiated with the business and tailored to the work of your employee.
- Gives you the opportunity to ‘grow your own’ staff instilling your business culture and working style from an early stage.
- Offers current employees the opportunity to develop their skills and obtain a BA (Hons) Business Management Professional in Hospitality and achieve Chartered status with the CMI.
- Complete a range of hospitality accredited short courses
- Develop a working partnership with Manchester Metropolitan University.

Contact

If you work in the hospitality sector and would like to discuss opportunities to engage with the new apprenticeship programme please get in touch.

Christopher Mitchell MIH SFHEA
Senior Learning & Teaching Fellow
C.Mitchell@mmu.ac.uk
0161 247 4666

mmu.ac.uk/apprenticeships

Department of Food and Tourism
Management
Hollings Faculty
C2.28 Cavendish Building
Cavendish Street
Manchester
M15 6BG

The information included here reflects the programme details as they are at the time of publication and is subject to change. The information is included as a guide to course content only.
Appendix 6
Legal Services Apprenticeships
Legal Services Apprenticeships
"I am delighted to chair this initiative at a time when the legal sector is facing some of the most significant changes in its history. There will always be a need for qualified solicitors who should be able to assume roles suitable to their skills. Well-managed businesses thrive from having clarity of roles and having the right people in the right roles. These changes will help enable this, creating jobs and adding value to clients and law firms alike."

**Emma Holt**

**Head of Pannone, part of Slater and Gordon**
About Legal Services Apprenticeships 2
Business benefits 4
The business commitment 6
Programme details 7
Recruitment 8
Manchester Law School 9
About Legal Services Apprenticeships

Grow your workforce with Legal Services Apprentices

Manchester Law School is firmly at the vanguard of offering new entry points into the legal profession for bright young people. This is radically changing the landscape of legal education and we would like more firms to join the revolution. Manchester Law School is working on this exciting new initiative with several national and regional law firms. In doing so we are supporting the changing resource requirements of firms, driven by the seismic changes occurring in the legal services market.

All legal firms are being challenged to look at how they perform their legal duties, but also how they perform as an effective business across all aspects of operations. These challenges need a response with the aim of creating a leaner working model and a more robust and diverse range of skills. This requires an investment in time, targeted training and the right resource in place. Manchester Law School’s overriding goal is to support growing and entrepreneurial law firms to develop and structure apprenticeship roles to deliver high quality, cost effective legal services.

Your firm could utilise this opportunity to embrace the challenges and expand your workforce by attracting bright young students to the profession.

What is a Legal Services Apprenticeship?

It is a job, generally offered for a minimum of two years, linked to a structured technical legal qualification delivered by an approved provider where apprentices are regularly assessed for competence.

Apprenticeships can be used to recruit to a wide range of job roles including:

- Trainee Legal Executive
- Paralegal
- Senior Paralegal
- Senior Claims Handler
- Paralegal Team Leader
- Personal Injury Specialist
- Fee Earner
- Litigation Executive

The programme provides training and assessment for apprentices on the practical skills required for their role in the workplace, and also the underpinning law. Apprentices are assessed on both skills and academic law. They are supported throughout the period of training by a Manchester Metropolitan University Assessor, usually a qualified solicitor, who visits the workplace on a regular basis to assess and develop those vital workplace skills.

There are three aspects to the qualification:

- The ‘technical’ qualification is the knowledge-based facet which forms the academic element of the scheme.
- The ‘competence’ qualification is based on observation of practical skills.
- The ‘functional skills’ are competencies in English, Maths and ICT, although candidates with recent A-C passes at GCSE in these subjects will be exempt.
The Technical Certificate

The ‘technical certificate’ provides the academic legal knowledge and the awarding body is CILEx (the Chartered Institute of Legal Executives). As well as being taught (on day release, distance learning or a blend of both), it also contains an exam-based element. The apprentices learn the legal theory and knowledge and then apply it to their day-to-day work.

Although it is an option to complete the technical certificate through distance learning, our experience of apprenticeships has taught us that only exceptional learners or those with pre-existing legal experience do well on a distance learning only route. A Legal Services Apprenticeship is a steep learning curve and learners thrive on programmes that are taught with face-to-face contact.

The Competence Certificate

The competence-based skills element of the apprenticeship is included to ensure the apprentices understand their roles and have the skills required to carry out the job. They are assessed in prescribed areas to demonstrate competence and evidence is gathered from their own practical experience and work in the office. It may be a file note they have made when dealing with a client, witness testimony from their employer, or an observation from a prescribed assessor. This assessor observes and assesses competence in the workplace and in most cases, uses work that the apprentice is completing as part of their fee-earning role. The assessment and evidence to demonstrate competence is driven by the apprentice and the real life work they are doing.

Functional Skills

Functional skills in English, Maths and ICT are a prescribed requirement of any apprenticeship framework and address a perceived lack of ability in key areas (identified by Government and employers).
"At Slater Heeles my role encompasses everything from ad hoc office jobs to visiting clients in care homes. I have been thrown in at the deep end, which I love. I shadow my mentor and follow what she does so I am constantly learning. I am out of the office a lot, billing for my hours and making money for the firm already."

Jordan Calder
Apprentice at Slater Heeles

Reap the benefits of apprentices:

**Staff development**
Shape and grow your own workforce around business needs. An apprentice can progress from Level 3 all the way to Level 7, the equivalent of being a solicitor, through a variety of routes, which means that you can support your staff who have the skills and desire for ongoing training and development.

**Diversity**
This programme offers you, as an employer, access to people who may not otherwise have been part of your workforce so you can develop the variety and diversity of staff to meet your clients’ needs.

**University experience**
Our apprenticeship programme offers a package of study and a university experience (including enrolment as a student of Manchester Law School) that attracts the very best talent within the region.

**Cultural fit**
Instil your business culture and working style from an early age.

**Staff retention**
Retain more employees and provide this opportunity to study whilst working.

**Entrepreneurial**
Position yourself as an entrepreneurial employer by early engagement with a scheme that is still new to the sector.

**Strategic growth**
Compete effectively and maintain margins within the business whilst being able to demonstrate to clients that work is being processed efficiently.

**Funding**
Utilise government funding available for this wide range of skills and academic training. This is currently fully funded training for under 19 year olds and partial funding for over 19 year old apprentices. Manchester Met processes all the funding paperwork and simply requires employers to complete a return on a monthly basis, confirming ongoing employment of the apprentices within their business.
Apprentices choose one pathway and this is usually aligned to their specific area of work

<table>
<thead>
<tr>
<th>CILEx Level 3 Apprentices have a choice of the following pathways</th>
<th>Typical work undertaken on completion of the pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Litigation with Contract as the law subject</td>
<td>Advise on, and progress, straight-forward low value contract claims including simple debt recovery matters.</td>
</tr>
<tr>
<td>Civil Litigation with Tort as the law subject</td>
<td>Advise on, and progress, straight-forward fast-track personal injury claims; assist in more complex cases.</td>
</tr>
<tr>
<td>Conveyancing and Commercial Property</td>
<td>Conduct conveyances of domestic freehold registered land including drafting contracts, searches, mortgage documentation, completion and registration. Advise on residential and commercial leasehold</td>
</tr>
<tr>
<td>Private Client (Elderly Client Practice)</td>
<td>Advise on the law of succession; take will instructions and draft wills; register enduring powers of attorney; advise on lasting powers of attorney; prepare applications to the Court of Protection.</td>
</tr>
<tr>
<td>Private Client (Probate Practice)</td>
<td>Advise on law of succession; take will instructions and draft wills; advise on IHT threshold and exemptions; administer uncomplicated estates including completing oath forms and IHT forms.</td>
</tr>
<tr>
<td>Employment Practice</td>
<td>Advise employers/employees on straight-forward cases involving discrimination (age, disability, religion, sex, race), maternity and paternity rights, unfair dismissal and redundancy. Complete Employment Tribunal forms.</td>
</tr>
<tr>
<td>Family Practice</td>
<td>Advise on law relating to separation and divorce including contact and residence of children and distribution of assets; draft and file divorce petition.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4 Higher Level Apprenticeships will have a choice of the following pathways</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Litigation with Contract Law and Tort as the law subjects</td>
<td>Advise on resolving commercial disputes. Also advise about tactics and costs in commercial cases in England and Wales.</td>
</tr>
<tr>
<td>Debt and Insolvency with Contract Law as the law subject</td>
<td>Advise individuals on personal insolvency and companies about corporate insolvency.</td>
</tr>
<tr>
<td>Personal Injury with Tort as the law subject</td>
<td>Advise clients in simple personal injury cases and assist in cases that are more complex. Advise about damages, settlements and costs. Prepare cases for trial.</td>
</tr>
</tbody>
</table>
The Business Commitment

How does it work and what do I need to commit to?

- Apprentices are employed for a minimum of two years and we would require employers to commit to support and employ them throughout the entire duration of the programme. The qualifications are designed to be completed in 18 to 24 months although some apprentices may need longer.

- Apprentices are employees and as such are subject to your usual terms of employment and need to be paid at least the minimum wage for their age group. The majority of our apprentices are salaried in the region of £10k to £12k although this is at the discretion of the firm and needs to sit within your normal salary bands for those roles.

- You must commit to release your apprentices for teaching days at Manchester Law School, the dates of these will be given to you at the commencement of the programme. There are usually no more than ten teaching days in one academic year (average one every six weeks) plus exam days.

- The apprentices in your firm must be involved in sufficient legal work to enable them to complete the competence requirements of the apprenticeship.

- Apprentices will need a supervisor and mentor to help them with their workload and offer support through the qualifications. We will provide training to support those supervisors and mentors.

- You need to allow the apprentices time to complete their competence portfolio (this is done online using a secure and confidential system called Onefile) and to study for exams as part of their technical certificate. We would normally suggest a minimum of half a day per week with a recommendation of a day per week where possible.

- You need to allow the Manchester Law School Assessor access to your premises and to the apprentice and, where necessary, to their supervisor in order to conduct the competence assessments. These are arranged with your consent and at times convenient to you. On average, Assessors will not need to visit more than once a month.

- Our legal Legal Services Apprenticeship also offers an additional optional qualification from Manchester Met that equates to half of the first year of a qualifying law degree. We encourage learners to complete this in order to further evidence their professional qualification, as personal development and as a route to future qualification as a solicitor.*
Bespoke to your business needs

The current academic pathways available for Legal Services Apprenticeships cover areas of law in Civil Litigation (with Tort or Contract options), Employment, Family, Property (with both commercial and residential options) and Private Client.

Pathways such as Civil Litigation offer a good generic base for commencing a career in law in any firm and other pathways offer more bespoke training specific to a department or role.

Next steps

Following a Legal Services Apprenticeship, there are a variety of further study options open to the learner and employer. These include:

• University study with full-time, part-time or distance-learning options
• CILEx qualifications
• New trailblazer apprenticeship in Paralegal, CILEx Solicitor or SRA Solicitor in 2017.

*Benefits of using Manchester Met

Working with Manchester Met allows you to attract the highest calibre candidates and differentiate your apprenticeship role

Manchester Met is the only provider of Legal Services Apprenticeships offering a university experience in addition to the apprenticeship qualification – this is a major attraction for candidates who are set on a career in law.

All our apprentices are enrolled as students at Manchester Law School so they do not feel that they are sacrificing the university experience; therefore, we attract candidates with very good academic credentials who would have secured a place at university.

Apprentices study in our award-winning £75 million Business School with state-of-the-art facilities, situated in the heart of Manchester. We believe that offering a world class environment supports learning excellence and our dedicated and professionally qualified academic team also reflects that commitment to world class teaching.

Apprentices enjoy all the benefits of being a student, such as full access to our libraries (including Lexis Nexis and Westlaw law libraries), support for apprentices with disabilities or those requiring special educational support, assistance with careers advice or just the social benefits.

So much more than just a training provider! Manchester Met can work with you on all your workforce development across both legal and management disciplines, assisting with both recruitment and training. Because we understand both ‘Business’ and ‘Law’ we are ideally placed to partner you.
Recruitment

Recruit the right candidates for you

Entry requirements may be:

- Three A levels or equivalent (grade C or above) and a minimum A-C in English and maths at GCSE, if direct entry from school or college.

- Direct entry from an Intermediate Level Apprenticeship such as the Legal Administration pathway of the Business & Administration framework.

- Direct entry for existing staff working alongside fee earning teams (for example Administrators, Paralegal Assistants).

- Direct entry from another occupation, for example, Administration or Customer Services. Suitability for this entry route is assessed on an individual basis.

How do you recruit?

- Manchester Met can assist you in recruiting suitable candidates and already has a database of A Level School leavers who are interested in this programme.

- The recruitment process is quite flexible; you can handle the recruitment process yourself through your current processes and advertising channels or we can help you by advertising your job to students who have already shown an interest in this programme.

- You will need to promote your apprenticeship on the National Apprenticeship Service website and Manchester Met will assist you in completing those adverts.

- Join us at Open Days where you can meet candidates and promote your firm and apprenticeship roles. Join one of our assessment days to assist the recruitment process.

Timeline

- Interviews and Assessment centres:
  - February
  - March
  - April
  - June

- Enrolment to Apprenticeship:
  - August
  - September
  - October

- Teaching commences

- Employer Adverts

- Schools Liaison and Open Events
Manchester Law School

As one of the largest university law schools in the UK, and the only local education provider to deliver law courses at every stage of legal training, Manchester Law School at Manchester Met has been preparing young people for entry into professional practice for more than 30 years. In October 2013 we launched the new Level 3 Legal Services Apprenticeship and will be running this programme alongside a Level 4 Higher Level Apprenticeship.

We have been delighted to work with regional and national firms to assist in finding training solutions that not only fill a resource gap but also provides an excellent start for someone pursuing a career in law.

We have 65 members of qualified teaching staff across all legal disciplines. Many of our staff are professionally qualified as either a Solicitor or Barrister and understand the legal services sector from both an educational, as well as an operational perspective.

Working with a number of local and national firms, we have developed the only Master’s Level bespoke Management Qualification (Postgraduate Certificate in Legal Practice Management) to help firms to respond to changes in the legal sector.

Our expertise in legal education and across all aspects of management training cements our position as one of the UK’s primary providers of CPD and bespoke work place learning - a truly one-stop shop.
Legal Services Apprenticeships

- Shape and grow your own workforce around business needs
- Develop dedicated staff with the potential to meet your clients’ needs
- Attract the very best talent within the region
- Instil your business culture and working style from an early age
- Retain more employees
- Position yourself as an entrepreneurial employer
- Compete effectively and maintain margins
- Access government funding

Further information
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Mob: 07917 370341
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Web: www.law.mmu.ac.uk/lsa

@MMULegalApps
LegalServicesApprenticeships
Appendix 7
An Employer’s Guide to the Apprenticeship Levy
An Employer’s Guide to the Apprenticeship Levy

In April 2017 the way apprenticeships are funded is changing, with implications for organisations with a payroll of more than £3 million per year. This guide explains what is going to change, the actions you can take to prepare and how we can support you to provide apprenticeships in your organisation.
The Apprenticeship Levy

From April 2017 there will be major changes introduced to the way in which the Government funds apprenticeships. This will be especially relevant to organisations that have a payroll of more than £3 million, as they will be required to make a payment of 0.5% of any staff costs above this threshold.

The levy payment is held in an account and available for organisations to spend on accredited apprenticeship programmes, such as those at Manchester Metropolitan University, within an 18-month period. Any levy contributions remaining unused at the end of the qualifying period will be used more generally to fund apprenticeships.

Will I have to pay the levy?

The levy applies to all organisations based in the UK and if your payroll exceeds £3 million you will have to pay the levy. For the purposes of calculating your levy payment, payroll is considered to be the total employee earnings subject to class 1 secondary National Insurance Contributions (NICs).

There are no exemptions from paying the levy if you are above the qualifying amount, and organisations based in all four countries of the United Kingdom will have to pay.

How much will I have to pay?

Employers will receive a fixed annual allowance of £15,000 to offset against the 0.5% levy payments, meaning any organisation with a payroll of up to £3 million will not have to pay the levy as shown for Organisation 1.

Organisation 1:
50 Employees
(Payroll £1 million)

Number of employees times mean salary =
50 x £20,000 = £1,000,000

Levy = 0.5% x £1,000,000 = £5,000
£5,000 minus allowance of £15,000 = £0 levy payment

In this example the organisation does not have to pay the levy.

Above £3 million the allowance is not enough to offset the levy liability, therefore payment will be required as shown for Organisation 2.

Organisation 2:
200 Employees
(Payroll £4 million)

Number of employees times mean salary =
200 x £20,000 = £4,000,000

Levy = 0.5% x £4,000,000 = £20,000
£20,000 minus allowance of £15,000 = £5,000 levy payment

For every £1 million over the payment threshold, organisations will be required to make a levy payment of £5,000.

How is the levy collected?

Your levy payment will be taken through the Pay as You Earn (PAYE) process alongside tax and National Insurance Contributions (NICs). You are responsible for declaring the amount you must pay monthly, the month after you have calculated the liability.

What can levy payments be spent on?

Levy payments can be used on a new apprenticeship standard or an existing framework, with an approved training provider, such as Manchester Metropolitan University. If you would like to find out how the University can support you to develop new standards to meet your skills needs, please contact us or visit www.mmu.ac.uk/apprenticeships.

Funds in your account can only be spent on the cost of training and end point assessments. It cannot be used for wages or expenses.
Key dates

June 2016 - Funding limits, provisional support, extra incentives revealed, final eligibility rules and provider information.

October 2016 - Final levels of funding and full draft eligibility rules published.

December 2016 - Final detailed funding and eligibility rules and further guidance on calculating payments.

January 2017 - Digital apprenticeship service registration.

April 2017 - Levy payments commence.

Do levy payments have to be used for new staff?

No. You will be able to use your levy payments to both attract new talent to your organisation and also support your existing staff to develop new skills, and grow as professionals. Degree Apprenticeships, such as those developed by Manchester Met are flexible and can be tailored to complement your employees career development.

Is there a limit to what can be spent on one apprenticeship?

Yes. Funding caps will be in place and will vary depending on the type of apprenticeship programme.

How do I manage my levy payments?

You will be able to access your levy funds through the digital apprenticeship service. You will need to register for the service and you will be able to do this from January 2017.

What are Government top-ups?

The Government will top-up every pound of your levy contributions by 10 pence. That means for every £1 entering your account there will be £1.10 available to spend on apprenticeship programmes.

Is there a time limit on levy payments?

Although levy payments are collected monthly, they will expire after 18 months unless they are spent on approved training. This also applies to any top-ups applied. The oldest funds in your account will be spent first, minimising expiry.

Are there other incentives available?

There will be additional support paid to you for taking on an apprentice under 19 years of age or for enrolling an apprentice with additional needs. Additional payments will vary and are paid via your training provider.

How does funding work for organisations with a payroll of below £3 million?

The government will continue to make a substantial contribution towards apprenticeships for organisations using a system of co-investment.

Once an organisation has negotiated a fee for apprenticeship training with a provider they will be expected to make a payment and the government will contribute the remainder up to the maximum for that particular apprenticeship. In time, and from 2018 at the earliest, these payments will also be made through the digital apprenticeship service.
Key facts at a glance

- The levy will be 0.5% of your payroll bill in excess of £3 million, paid through PAYE.
- Organisations with a payroll below the threshold will not have to pay the levy.
- Payments, once collected, will be stored in a digital account and can be redeemed via approved apprenticeship schemes.
- The Levy can not be used for additional expenses, overheads and wages.
- Levy payments must be used within 18 months.
- For every £1 paid in levy payments, employers will be given an additional 10 pence by the government, paid into their digital account.
- Organisations not paying the levy will continue to receive government support and will be migrated to a digital account from 2018.

Contact

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f MMUApprenticeships

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United Kingdom

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Appendix 8

Civil Engineering Site Manager Apprenticeship Standard

CIVIL ENGINEERING SITE MANAGEMENT Trailblazer Apprenticeship Standard

Occupation(s)
The occupation covered by this standard is that of Civil Engineering Site Management. Typical job titles can include: Site Manager, Sub Agent, Assistant Site Manager or Section Engineer. They are associated with the management of civil engineering and infrastructure projects and are based on sites or in offices.

Occupational profile
The main duties and tasks in Civil Engineering Site Management are:
- To ensure that safe systems of work are in place on their site and that all staff adhere to them
- To translate design information to construction teams so they can construct the project effectively and efficiently
- To manage the productivity on the site so that the project is completed on time
- To ensure that the project is completed to the specification and quality needed by the client
- To manage the activity on site in a way that adheres to cost and contract constraints
- To ensure that the site has minimal negative impact on the environment and community
- To manage interfaces between stakeholders associated with the project

Requirements: Knowledge, Skills (and behaviours)

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering Knowledge</td>
<td>Understand engineering principles, codes and standards including, but not limited to: transportations, buildings, infrastructure, utilities and structures.</td>
</tr>
<tr>
<td>Civil Engineering Solutions</td>
<td>Understand the client’s needs and the practicality of using certain engineering solutions to meet those needs, taking into account constraints and opportunities.</td>
</tr>
<tr>
<td>Civil Engineering Techniques</td>
<td>Understand design principles, building surveys, costing, risk analysis, sustainability, Health and Safety, buildability, contract law.</td>
</tr>
<tr>
<td>Project Management</td>
<td>Understand the project management cycle including the planning, budgeting, project funding and payment processes so as to lead to effective project delivery.</td>
</tr>
<tr>
<td>People and Resources</td>
<td>Understand principles of teamworking, staff co-ordination, supply chain management, performance management and the development of people.</td>
</tr>
<tr>
<td>Quality Management</td>
<td>Understand the importance maintaining of quality standards, using records, systems, tools and techniques for quality improvement.</td>
</tr>
<tr>
<td>Commercial and Legal Awareness</td>
<td>Understand budgets, costs, various forms of contract, procurement and record keeping and their impact on project success, profitability and meeting the budget.</td>
</tr>
<tr>
<td>Communication</td>
<td>Understand different forms of communication (written, verbal, electronic) and evaluate the best solution for different circumstances.</td>
</tr>
<tr>
<td>Working with Others</td>
<td>Be aware of the importance of good working relationships, the needs of others and equality and diversity in the workplace.</td>
</tr>
<tr>
<td>Safe Systems of Work</td>
<td>Understand obligations for Health, Safety and Welfare issues on site, how to identify potential hazards and manage the risks</td>
</tr>
<tr>
<td>Sustainability</td>
<td>Understand the environmental impact of civil engineering activities and how to minimise negative impacts during all stages of the project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skill</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil Engineering Knowledge and Understanding</td>
<td>To develop and apply practical engineering solutions using established and emerging civil engineering technologies such as, but not limited to, new materials or off-site manufacture</td>
</tr>
<tr>
<td>Civil Engineering Application</td>
<td>Be able to identify, review and select techniques, procedures and methods to undertake engineering tasks. Be able to contribute to the design, development and implementation of engineering solutions and evaluate their effectiveness</td>
</tr>
<tr>
<td>Management and Leadership</td>
<td>Be able to plan for effective project management, plan and organise resources, tasks and people. Be able to manage teams and staff to meet project requirements and be able to</td>
</tr>
</tbody>
</table>
manage quality processes.

**Commercial Ability**
Be able to prepare and control budgets and apply statutory and commercial frameworks to ensure profitability and adherence to budget.

**Health, Safety and welfare**
Be able to identify and manage risks of health, safety and welfare in line with legislation, hazards and safe systems of work.

**Sustainable Development**
Be able to manage engineering activities in a way that contributes to sustainable development and implements best practice.

**Interpersonal Skills and Communication**
Be able to communicate well with others at all levels and discuss plans and issues. Demonstrate personal and social skills and an ability to deal with colleagues and stakeholders in a way that enhances equality and diversity. Be able to proactively transfer information to teams and staff.

### Behaviours | What is required
--- | ---
**Take Responsibility** | Be responsible for your own work and that of others.
**Independent Judgement and Responsibility** | Exercise independent engineering judgement, take responsibility for actions and decisions and operate within the constraints of own skills and knowledge.
**Complying with Codes of Conduct** | Be able to operate within the Institution of Civil Engineers Code of Conduct and implement work activities within the context of industry issues. Promote ethical behaviour in others and promote the construction industry.
**Maintaining Continuing Professional Development** | Identify own development needs and take appropriate action to meet those needs. Use own knowledge and expertise for the benefit of others.

### Duration
The typical duration for this apprenticeship is three to four years but this will depend on the previous experience of the apprentice and access to opportunities to gain the full range of competence.

### Entry requirements
Individual employers will set their own selection criteria for this apprenticeship. As it requires achievement to Level 6 and a high level of Maths the typical entry requirements for this Apprenticeship will be the completion of the Level 4 Construction Technician Standard; EngTech TMICE status; HNC in Civil Engineering or equivalent qualifications and commensurate experience.

### Qualifications
The following qualifications will be gained:
- BEng (Hons) Civil Engineering or equivalent Level 6 Civil Engineering Diploma, mapped to UK-Standard for Professional Engineering Competence (UK-SPEC) for Incorporated Engineer
- Industry certificates in Site Safety Plus Site Managers’ Safety Training Scheme and Site Environmental Awareness Training Scheme which are required for safe operations in the workplace
- English will be required to be demonstrated at Level 3 and Maths will be required to be demonstrated at Level 5 for Incorporated Engineer status. These may be demonstrated in the BEng(Hons) Civil Engineering.

### Link to professional registration
This Apprenticeship will include the knowledge, skills and behaviours required to achieve Incorporated Engineer status with the Institution of Civil Engineers and lead to the designatory letters IEng MICE. The professional review process for IEng MICE is included in the final assessment process for this Apprenticeship.

### Level
This apprenticeship standard is at Level 6.

### Review date
This apprenticeship standard should be reviewed three years after approval of the standard.
Appendix 9

Digital Technology Solutions Professional Apprenticeship Standard

APPRENTICESHIP STANDARD

OCCUPATION: Digital & Technology Solutions Professional – degree apprenticeship

<table>
<thead>
<tr>
<th>Typical Job titles:</th>
<th>Software Developer, Software Engineer, Software Tester, Application Specialist, Business Analyst, IT project Manager, IT Consultant, Network Engineer, Cyber Security Analyst, Database Specialist, Data Analyst, Digital Media Technology Practitioner, Systems Designer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration:</td>
<td>Typically 36 months</td>
</tr>
<tr>
<td>Level:</td>
<td>6</td>
</tr>
<tr>
<td>Award</td>
<td>BSc (Hons) in Digital &amp; Technology Solutions</td>
</tr>
</tbody>
</table>

Role Profile
A Digital & Technology Solutions Professional provides technology enabled solutions to internal and/or external customers, in a range of areas including software, business and systems analysis, cyber security, data analysis and network infrastructure. They implement technology solutions that enable businesses to develop new products and services and to increase an organisation’s productivity using digital technologies. They are confident, competent and capable independent Technology Solutions Professionals able to operate in a range of related roles. The occupation is based upon a core set of outcomes that will be supplemented by one, and only one, of six specialism areas detailed below that cover the roles identified by employers.

Entry Requirements
Individual employers will set the selection criteria, but this is likely to include three ‘A’ levels, including maths, although some employers will accept other relevant qualifications or experience.

Core Skills
- Information Systems: is able to critically analyse a business domain in order to identify the role of information systems, highlight issues and identify opportunities for improvement through evaluating information systems in relation to their intended purpose and effectiveness.
- Systems Development: analyses business and technical requirements to select and specify appropriate technology solutions. Designs, implements, tests, and debugs software to meet requirements using contemporary methods including agile development. Manages the development and assurance of software artefacts applying secure development practices to ensure system resilience. Configures and deploys solutions to end users.
- Data: identifies organisational information requirements and can model data solutions using conceptual data modelling techniques. Is able to implement a database solution using an industry standard database management system (DBMS). Can perform database administration tasks and is cognisant of the key concepts of data quality and data security. Is able to manage data effectively and undertake data analysis.
- Cyber Security: can undertake a security risk assessment for a simple IT system and propose resolution advice. Can identify, analyse and evaluate security threats and hazards to planned and installed information systems or services (e.g. Cloud services).
- Business Organisation: can apply organisational theory, change management, marketing, strategic practice, human resource management and IT service management to technology solutions development. Develops well-reasoned investment proposals and provides business insights.
- IT Project Management: follows a systematic methodology for initiating, planning, executing, controlling, and closing technology solutions projects. Applies industry standard processes, methods, techniques and tools to execute projects. Is able to manage a project (typically less than six months, no inter-dependency with other projects and no strategic impact) including identifying and resolving deviations and the management of problems and escalation processes.
- Computer and Network Infrastructure: can plan, design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context. Identifies network security risks and their resolution.

Core Technical Knowledge
Knows and understands:
- How business exploits technology solutions for competitive advantage.
- The value of technology investments and how to formulate a business case for a new technology solution, including estimation of both costs and benefits.
- Contemporary techniques for design, developing, testing, correcting, deploying and documenting software systems from specifications, using agreed standards and tools.
- How teams work effectively to produce technology solutions.
- The role of data management systems in managing organisational data and information.
- Common vulnerabilities in computer networks including unsecure coding and unprotected networks.
- The various roles, functions and activities related to technology solutions within an organisation.
- How strategic decisions are made concerning acquiring technology solutions resources and capabilities including the ability to evaluate the different sourcing options.
- How to deliver a technology solutions project accurately consistent with business needs.
- The issues of quality, cost and time for projects, including contractual obligations and resource constraints.

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Core Behavioural Skills

<table>
<thead>
<tr>
<th>Professional, interpersonal and business skills</th>
<th>Attributes and behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fluent in written communications and able to articulate complex issues.</td>
<td>• Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality.</td>
</tr>
<tr>
<td>• Makes concise, engaging and well-structured verbal presentations, arguments and explanations.</td>
<td>• Flexible attitude.</td>
</tr>
<tr>
<td>• Able to deal with different, competing interests within and outside the organisation with excellent negotiation skills.</td>
<td>• Ability to perform under pressure.</td>
</tr>
<tr>
<td>• Is able to identify the preferences, motivations, strengths and limitations of other people and apply these insights to work more effectively with and to motivate others.</td>
<td>• A thorough approach to work.</td>
</tr>
<tr>
<td>• Competent in active listening and in leading, influencing and persuading others.</td>
<td>• Logical thinking and creative approach to problem solving.</td>
</tr>
<tr>
<td>• Applies analytical and critical thinking skills to Technology Solutions development and to systematically analyse and apply structured problem solving techniques to complex systems and situations.</td>
<td></td>
</tr>
<tr>
<td>• Able to put forward, demonstrate value and gain commitment to a moderately complex technology-oriented solution, demonstrating understanding of business need, using open questions and summarising skills and basic negotiating skills.</td>
<td></td>
</tr>
<tr>
<td>• Able to conduct effective research, using literature and other media, into IT and business related topics.</td>
<td></td>
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</tbody>
</table>

Review date

This standard will be reviewed in two years from the date of publication.

Specialism Outcomes

Each of the specialisms is set out below. All apprentices will require the core skills and knowledge to be combined with the specialist skills and knowledge to be able to operate effectively in the defined role. The employer will select one, and only one, of the specialisms for the apprentice which is specific to the role the apprentice will be performing.

<table>
<thead>
<tr>
<th>Specialism title</th>
<th>Software Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role Details</td>
<td></td>
</tr>
<tr>
<td>The primary role of a software engineer is to be able to design, build and test high-quality software solutions. The software engineer role is broader and with higher levels of responsibility than a software developer as they need to apply engineering principles to all stages of the software development process, from requirements, analysis and design, development and data requirements whilst ensuring security robustness is built in. They will typically be working as part of a larger collaborative team and will have responsibility for significant elements of software projects.</td>
<td></td>
</tr>
</tbody>
</table>

Skills

Be able to:

- Create effective and secure software solutions using contemporary software development languages to deliver the full range of functional and non-functional requirements using relevant development methodologies.
- Undertake analysis and design to create artefacts, such as use cases to produce robust software designs.
- Produce high quality code with sound syntax in at least one language following best practices and standards.
- Perform code reviews, debugging and refactoring to improve code quality and efficiency.
- Test code to ensure that the functional and non-functional requirements have been met.
- Deliver software solutions using industry standard build processes, and tools for configuration management, version control and software build, release and deployment into enterprise environments.

Technical Knowledge

Knows and understands:

- How to operate at all stages of the software development lifecycle.
- How teams work effectively to develop software solutions embracing agile and other development approaches.
- How to apply software analysis and design approaches.
- How to interpret and implement a design, compliant with functional, non-functional and security requirements.
- How to perform functional and unit testing.
- How to use and apply the range of software tools used in Software engineering.

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Skills
Be able to:
- Perform technical process improvement tasks in a range of environments to solve business problems.
- Present optimised solutions to improve business process and workflows through improved technology.
- Recommend options based upon risks, costs vs benefits, and impact on other business processes.
- Participate in walk-throughs for IT, to identify and document key risks within a client’s organisation.
- Support training of end-users in preparation for system activation.
- Evaluate the success of a new system, process, initiative, etc.

Technical Knowledge
Knows and understands:
- How consulting ties into project management, business analysis and business management.
- The barriers to solving problems or maximizing opportunities.
- How to present recommendations and influence action.
- The different structured process approaches for digital technology consulting.
- How to frame/define business problems objectively before solving them.
- How to discover hidden requirements using probing techniques to establish trust, using open and closed questions effectively, and avoiding leading questions.

Specialism title: Business Analyst

Role Details
A business analyst is responsible for assessing the business impact of change, capturing, analysing and documenting requirements and supporting the communication and delivery of requirements with relevant stakeholders. They create detailed analysis of systems and make recommendations for improvement. They produce specifications of user requirements that enable software engineers to develop the right software solutions. They require a broad foundation of skills and knowledge to be able to be effective as their work incorporates all aspects of digital technology systems.

Skills
Be able to:
- Develop and apply modelling and analysis techniques to describe business problem scenarios and to help select solutions using a range of industry standard analysis techniques.
- Elicit and prioritise business requirements for a digital technology system using ‘industry best practice’ methods.
- Develop a clear, complete, unambiguous and testable requirements specification, including functional, non-functional, data, user interface and security requirements.
- Model the ‘as is’ and future state for a business process using industry standard approaches and notation.
- Evaluate selected models against business objectives and system requirements.
- Use ‘industry’ standard tools to facilitate the analysis, documentation and traceability of requirements.

Technical Knowledge
Knows and understands:
- The use of requirements elicitation techniques and their relevance to given situations.
- The principles of requirements engineering and the importance of managing requirements.
- How to conduct a range of business/organisational analyses.
- The use of tools to support modelling and requirements engineering.
- How the selected models inter-relate with each other.
- How the products of analysis feed into the design and development of a system.

Specialism title: Cyber Security Analyst

Role details
A cyber security analyst is responsible for the implementation, maintenance and support of the security controls that protect an organisation’s systems and data assets from threats and hazards. They ensure that security technologies and practices are operating in accordance with the organisation’s policies and standards to provide continued protection. They require a broad understanding of network infrastructure, software and data to identify where threat and hazard can occur. They are responsible for performing periodic vulnerability assessments to evaluate the organisation’s ongoing security posture and will provide visibility to management of the main risks and control status on an ongoing basis. They respond to security incidents and implement resolution activities across the organisation.

Skills
Be able to:
- Analyse and evaluate security threats and vulnerabilities to planned and installed information systems or services and identify how these can be mitigated against.
- Perform security risk assessments for a range of information systems and propose solutions.
- Develop a security case against recognised security threats, and recommend mitigation, security controls and appropriate processes.
- Define and justify a user access policy for an information system given knowledge of the system architecture, security requirements and threat/risk environment. This should be in terms of what they can do, resources they can access, and operations they are allowed to perform.
- Perform a business impact analysis in response to a security incident and follow a disaster recovery plan to meet elements of a given business continuity policy.
- Conduct a range of cyber security audit activities to demonstrate security control effectiveness.

Technical Knowledge
Knows and understands:
- The types of security (confidentiality, authentication; non-reputation; service integrity) and security big picture (network security; host OS security; physical security).
- The main types of common attack techniques, including phishing, social engineering, malware, network interception, blended techniques, denial of service and theft.
- How to recognise and assess risk including performing a risk assessment.
- How to apply penetration testing effectively and how it contributes to assurance.
- The different approaches to risk treatment and management in practice.
- What the ‘cyber security culture’ in an organisation is, and how it may contribute to security risk.
### Data Analyst

**Role Details**
The primary role of a data analyst is to collect, organise and study data to provide new business insight. They are responsible for providing up-to-date, accurate and relevant data analysis for the organisation. They are typically involved with managing, cleansing, abstracting and aggregating data across the network infrastructure. They have a good understanding of data structures, software development procedures and the range of analytical tools used to undertake a wide range of standard and custom analytical studies, providing data solutions to a range of business issues. They document and report the results of data analysis activities making recommendations to improve business performance. They need a broad grounding in technology solutions to be effective in their role.

**Skills**
- Be able to:
  - Import, cleanse, transform, and validate data with the purpose of understanding or making conclusions from the data for business decision making purposes.
  - Present data visualisation using charts, graphs, tables, and more sophisticated visualisation tools.
  - Perform routine statistical analyses and ad-hoc queries.
  - Use a range of analytical techniques such as data mining, time series forecasting and modelling techniques to identify and predict trends and patterns in data.
  - Report on conclusions gained from analysing data using a range of statistical software tools.
  - Summarise and present results to a range of stakeholders making recommendations.

**Technical Knowledge**
- Knows and understands:
  - The quality issues that can arise with data and how to avoid and/or resolve these.
  - The processes involved in carrying out data analysis projects.
  - How to use and apply industry standard tools and methods for data analysis.
  - The range of data protection and legal issues.
  - The fundamentals of data structures, database system design, implementation and maintenance.
  - The organisation's data architecture.

### Network Engineer

**Role Details**
The primary role of a network engineer is to design, install, maintain and support communication networks within an organisation or between organisations. They need to maintain high levels of network performance and availability for their users, such as staff, clients, customers and suppliers. They will understand network configuration, cloud, network administration and monitoring tools, and be able to give technical advice and guidance. As part of their role they need to be proficient in technology solutions as they will analyse system requirements to ensure the network and its services operate to desired levels. They will need to understand the data traffic and transmission across the network and they have a major role to play in ensuring network security.

**Skills**
- Be able to:
  - Plan, design, build and test a simple network to a requirement specification that includes hubs, switches, routers and wireless user devices, applying appropriate security products and processes.
  - Identify the key characteristics of a new network service and develop estimates of the expected traffic intensity and traffic load that the network must support.
  - Determine the minimum network capacity of planned networks to meet network requirements.
  - Design, build, test, configure and optimise a distributed network (more than 1 sub-net), including switches, routers and firewalls to meet given requirements.
  - Analyse network performance and troubleshoot typical problems in networks.
  - Identify and evaluate network security risks and incorporate appropriate security products and processes into network designs to increase security, resilience and dependability.

**Technical Knowledge**
- Knows and understands:
  - The fundamental building blocks (e.g. routers, switches, hubs, storage, transmission) and typical architectures (e.g. server/client, hub/spoke) of computers, networks and the Internet.
  - The main features of routing and Internet network protocols in use, their purpose and relationship to each other, including the physical and data link layer (e.g. https, HTTP, SMTP, SNMP, TCP, IP, etc.).
  - The main factors that affect network performance (e.g. the relationship between bandwidth, number of users, nature of traffic, contention).
  - Failure modes in protocols (e.g. why a protocol may ‘hang’ and the effect of data communication errors).
  - The ways to improve performance (e.g. application of traffic shaping, changes to architecture to avoid bottlenecks, network policy that prohibit streaming protocols).
  - The issues that may arise in the day to day operation of networks and how to resolve them.
Appendix 10

Digital Technology Solutions Professional Assessment Plan

DIGITAL INDUSTRIES - ASSESSMENT PLAN
DIGITAL & TECHNOLOGY SOLUTIONS PROFESSIONAL
BSC (Hons) Digital & Technology Solutions

Introduction

The Technology Solutions Professional is an apprenticeship that typically will take 3 years or more to complete. It leads to a BSc Honours degree qualification that is contextualised for workplace occupational competency as a Digital & Technology Solutions Professional who can operate in one of the following roles:

- Software Engineer
- IT Consultant
- Business Analyst
- Data Analyst
- Cyber Security Analyst
- Network Engineer

This new route to recruitment of young talent for employers will produce competent technology solutions professionals to complement their graduate recruitment and apprenticeship programmes. This apprenticeship will develop the technical, business, project, interpersonal and behavioural skills and knowledge to operate effectively in the digital economy.

What distinguishes this apprenticeship is the blend of employer defined skills, knowledge and behaviour outcomes that are integrated and assessed as part of the degree. The achievement of the degree ensures that the standard has been met. This is a closed degree for this occupation and the degree also acts as assessment verification that the standard has been met by the apprentice.

The assessment approach within the degree has been designed to ensure that apprentices meet the skills, knowledge and behaviour outcomes as defined in the standard whichever university is delivering the programme. This means that universities will need to carefully design their programmes and delivery to ensure all aspects of the standard are met. They will also need to develop approaches to delivery and assessment that will deliver high quality education and training to apprentices and fulfil employer expectations.

The universities will implement assessment that focuses on the specialism chosen and this will be assessed through a comprehensive project based end point assessment within the degree. The end point assessment has two elements; the project assessment and presentation assessment. Completion of the project and presentation signify the completion of not only the degree but the overall programme.

Universities have robust and respected assessment processes and quality assurance that incorporates internal moderation and external examiners to ensure independence across the degree programme and between the suggested formative and end point assessment.

The remainder of this assessment plan will set out the approach to assessment, including what will be assessed, how it will be assessed and the role of the assessors, employer and apprentice in the assessment process.
1. Assessment Overview

The delivery of the apprenticeship by the university provides an integrated approach to developing and assessing skills and knowledge across the range of modules in the degree programme. Each university will develop its own degree programme and will map the individual modules to the outcomes in the standard. Individual modules will contribute formative assessment to the skills, knowledge and behaviour outcomes en-route to the final synoptic project and presentation. The final synoptic project is a substantial piece of work, typically taking around 6 months to undertake alongside the apprentices normal duties to their employer. The end point assessment integrates the project outcomes and presentation into the overall synoptic project assessment. It is this end point assessment which will be judged against the standard, and test the skills, knowledge and behaviours together as applied through the project.

The separation of suggested formative assessment to final assessment of the degree is shown in figure 1 below.

2. Assessment Details

This is typically a three to four year apprenticeship with an integrated approach to the assessment of knowledge, skills and behaviours. Delivery and assessment are organised through a range of

Figure 1 overview of assessment

Formative Module Assessments

In Course Module Assessment

Range of modules develop skills, knowledge and behaviours progressively against the standard. Suggested formative assessments increasingly weighted toward end performance.

Final Synoptic Assessment

Two methods of synoptic assessment – project and presentation

The work based project takes place near the end. It is a substantial piece of work typically lasting 6 months and covers the skills, knowledge and behaviours defined in the standard.

The presentation covers the project problem domain, approach, outcomes and the skills, knowledge and behaviours demonstrated.

Both elements are assessed in partnership by employer and university.

Informs final grading

External Examiners
‘modules’ that deliver the university’s approach to the curriculum. The modules will cover the breadth and depth of the standard using suggested formative assessment methods that integrate the knowledge, skills and behaviour components and which ensure that the apprentice is sufficiently prepared to undertake the synoptic project that will be assessed in partnership with the employer and against the standard.

The modules, synoptic project and their assessments can therefore be clearly mapped to the outcomes in the standard to show how the outcomes in the standard will be met.

2.1 Assessment methods

The assessment strategy includes formative and end point assessments. Formative assessment methods will include an appropriate mix of essays, reports, practical exercises, end tests and exams. These will be applied to the modules proposed by each university to assess the development of skills, knowledge and behaviours. The end point assessment is by synoptic project and presentation. Appendix 1 sets out the formative and end point assessment methods for the skills, knowledge and behaviours defined in the standard.

Employers have stated that apprentices must also maintain a digital portfolio of their completed work, to demonstrate their achievements and capabilities. The practical outputs of the assessments, including software, plans, reports etc. submitted for module assessments, will be collected and maintained in a digital portfolio of apprentices’ work. These will have been assessed against individual module assignments and the portfolio will not separately be assessed. It is the collection in one place of practical outputs that demonstrate evidence of the skills, knowledge and behaviours an apprentice has acquired against the standard. This will also include the synoptic project report and presentation.

2.2 Assessment processes

Early modules introduce awareness and establish the foundational skills. The levels of knowledge and skill build as the apprentices gain more experience in the workplace and can use and apply their knowledge and skills to develop improved competence.

Toward the end of the apprenticeship the apprentice will specialise in one occupational area. Later modules will increasingly focus on the specialism and will enhance the skills and knowledge in line with the standard.

2.2.1 Formative module assessment

The suggested formative module assessments assess the technical skills, and knowledge and behaviours as set out in the Digital & Technology Solutions Professional standard and as detailed in Appendix 1. In totality, the degree modules will cover the full range of the required skills and knowledge from the standard. The modules will be developed against the standard to integrate appropriate blends of skill and knowledge. This will enable individual instances of degree apprenticeship programmes to be mapped against the standard.

The suggested formative assessment will give an ongoing indication of performance against the final outcomes defined in the standard. The university and employer will be able to support the apprentice and provide extra guidance where performance issues might arise to ensure that the apprentice is fully supported in meeting the outcomes on the standard. This will provide regular review points to ensure guided progression.

This approach draws upon the established good practice already undertaken in universities, but with the advantage of employer support and the workplace context to help apprentices see the real world application of their skills, knowledge and behaviours on an ongoing basis.
In practice this means that:

- apprentices acquire skills, knowledge and behaviours as defined in the standard via the modules and assessments provided by the university, and have equivalent outcomes across universities.
- employers can select their preferred university location and/or delivery model.
- apprentices do not have to be assessed more than once in specific knowledge areas.

Individual modules will be assessed and must be passed in accordance with university regulations. This will ensure that the student is prepared and ready to undertake the synoptic project near the end of the programme and that will demonstrate successful outcomes against the skills, knowledge and behaviours defined in the standard.

2.2.2 Synoptic project assessment

The synoptic project is a work based project that broadly represents the skills, knowledge and behaviours in the standard. The project will provide substantive evidence from a business-related project to demonstrate the application of skills and knowledge. The end point assessment integrates the project outcomes and presentation into the overall synoptic project assessment. It will take place over a period of around 6 months, near the end of the programme. It is designed to assess apprentices in a consistent way, irrespective of their particular workplace and university. Because of the significance of the project the employer and university should work together with the apprentice to agree a project that is achievable within the employer’s business constraints and that meets the requirements of the standard. The project should be conducted as part of the apprentice’s normal work. Employers should make suitable allowance for the project to be undertaken, both in terms of time and resources. However there are some elements such as the writing of the report, particularly in its reflective aspects that may be undertaken outside of normal work. This should be agreed between apprentice, employer and university such that apprentices are not disadvantaged in any way from performing their job and meeting the requirements of the project.

Any issues with confidentiality and/or security will also be addressed between the university, employer and apprentice allowing for projects of business value to be undertaken using real data.

The assessment of the synoptic project should include the employer’s assessment against the common criteria for the project. Every project assessment is required to incorporate employer contribution in addition to normal university project assessment. This needs to be consistent for all projects.

The project should relate to one of the specialisms in the standard. High-level descriptors of typical projects are given below for each of the specialisms in the standard.

**Software Engineer**

This could be a project to design and develop a significant piece of software or a new software product prototype to achieve defined business objectives, for a defined user group or customer group, to meet the business need and applying appropriate levels of security. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**IT Consultant**

This could be a project to undertake an IT consultancy project to formulate and evaluate technical alternatives to meet businesses requirements. This will likely include issues of integration with
existing technology and procedures, maintenance and expansion and the consideration of both proprietary and open source solutions as appropriate. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**Business Analyst**
This could be a Business Analysis study to analyse, and model a problem-specific domain and to develop a solution approach based upon the analysis. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**Cyber Security Analyst**
This could be an analysis of a given domain and evaluation of security threats and vulnerabilities to planned and installed information systems or services with a robust cyber security solution. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**Data Analyst**
This could be a project to analyse, devise and deploy data analytics solutions for a real-world problem domain. In particular, applying data analysis techniques, processes and tools to perform analytics for a significant data-driven business scenario. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**Network Engineer**
This could be a project to plan and configure a network to meet a defined specification, to satisfy security requirements, using one or more of the defined tools, to meet specified criteria and performance levels. It will include significant project planning including estimations of both time and cost to proposed solutions, include technical and commercial aspects of the proposed solution.

**Generic Content of the Synoptic Project**
Each project must enable the following to be demonstrated:

- the application of the core and specialism knowledge and skills to meet the outcomes in the standard;
- the approach to planning and completion of the project;
- the application of behaviours from the standard.

The project will cover all of the specialism skills, knowledge and behaviours as defined in the standard. The project will cover the specialism skills, knowledge and behaviours from the standard using the occupational domain to select the project as follows:

- Software Engineer: Show competence in software development processes, including the knowledge, skills, and professional competences necessary to practice as a software engineer in a business environment.
- IT Consultant: Perform technical, organisational, and process improvement tasks in a range of environments to solve business problems.
• Business Analyst: Apply structured processes for identifying, defining and analysing unstructured business problems, their root cause and impact.
• Cyber Security Analyst: Analyse and evaluate security threats and vulnerabilities to planned and installed information systems or services and identify how these can be mitigated against.
• Data Analyst: Use a range of analytical techniques such as data mining, time series forecasting and modelling techniques to identify and predict trends and patterns in data.
• Network Engineer: Plan, design, build and test a simple network to a requirement specification that includes hubs, switches, routers and wireless user devices applying appropriate security products and processes.

Practical Requirements for the design of Synoptic Projects
• Agreement to be made between apprentice, employer and university on what systems, tools and platforms will be required to complete the task and how these will be made available.
• Specification of what has to be delivered on completion of the project – must include the output, documented project plans etc.
• Apprentices are required to document their assumptions and to highlight the consequences of those assumptions – enabling them to show their understanding of commercial pressures, and the application of their thinking and problem solving skills.
• Terms of reference developed by the apprentice and agreed by the university and employer early in the project.
• University to provide clear project assessment criteria including terms of reference, approach to the problem, the design of the solution, the implementation of the solution, the final report and presentation etc.

Practical Requirements for the delivery of Synoptic Projects
• Universities will work with the employer and apprentice to agree suitable project title and support arrangements for the project to be undertaken.
• The project should normally be based an agreed business problem that forms part of the apprentices role.
• Suitable time should be set aside by the employer for the apprentice to plan, undertake and write up their project.
• For each project the apprentice will first work out what is required and present terms of reference and an initial plan for agreement across employer, apprentice and university.
• The project will be typically undertaken at the employer’s premises as agreed with the employer.
• The employer and university to ensure the apprentice has access to the specified systems, tools and platforms to complete the task.
• The apprentice to provide a signed statement to confirm it is his/her own work.
• Whilst other projects may typically be included during the programme, the synoptic project will be set and completed in the final year of the apprenticeship near the end of the programme.

Practical Requirements for the project environment
• A suitable project environment should be provided ensuring access to all required tools, systems etc. This may be the apprentice’s normal workstation or may be another environment as appropriate to the nature of the project.
• Someone responsible for managing the project from the employer perspective.
• The university project tutor will oversee and provide support to the apprentice.
2.2.3 The Presentation

The presentation is a structured discussion between the apprentice and their university lecturers and employer, focusing on the outcomes of the synoptic project. It covers both what the apprentice has done, the standard of their work, and also how they have done it. Typically this is the approach taken in university individual projects. This enables the assessment to include the assessment of skills, knowledge and behaviours as required by the standard.

The purpose of the presentation is to review:

- what the apprentice set out to achieve;
- what they have actually produced in the project;
- the standard of their work;
- how they have approached the work and dealt with any issues arising;
- clarify any questions the university/employer has from their assessment of the project;
- explore aspects of the project work, including how it was carried out, in more detail;
- confirm the demonstration of appropriate interpersonal and behavioural skills.

The presentation will be assessed as part of the overall project assessment. The university will provide guidance on the nature of the presentation and the assessment criteria used. This will ensure that consistent approaches are taken and that all key areas are appropriately explored. The initial and primary focus for the presentation is on the work presented in the project. However, the presentation assessors can explore the apprentice’s broader experience from the workplace, to demonstrate that the skills and knowledge defined in the standard have been met.

Practical Requirements for the Presentation

- The presentation will take place following the completion of the project and the preparation of the final report.
- The apprentice should have appropriate notice of their presentation time and have at least seven days’ notice.
- A structured brief will be used to support the presentation to ensure a consistent approach.
- The presentation and Q&A will typically last 30 minutes – and no more than one hour.
- The presentation will be conducted face to face or in exceptional circumstances via live media.
- The presentation will be conducted in a suitable location that allows for the project outcomes to be demonstrated. This may be at the university or employer location as appropriate.
- The university must put the apprentice at ease and give the apprentice the opportunity to do his/her very best.
- The presentation is to university module assessor(s) and the employer at the same time.

2.3 Final Assessment and Grading

All apprentices will be studying for a BSc Honours degree in Digital & Technology Solutions. It is the achievement of the Honours degree that demonstrates that the standard has been met and which provides the grading. The grading of the degree award is significantly made up of the synoptic project assessment together with module assessments. The Honours degree award and classification is based on a weighted average mark of the assessed work the apprentice has completed. The synoptic project assessment is a critical component of this.
project contributes greatly to the final year marks. The final year overall contributes to the grading typically in the ratio of 3 – 5 times that of second year modules (based on a three year model). The synoptic project must be passed in all cases to achieve the degree award.

Apprentices will be graded using Honours degree classifications for English universities. All UK universities must follow the QAA (Quality Assurance Agency for Higher Education) Code of practice for the assurance of academic quality and standards in higher education. This ensures continued consistency across universities.

The national degree award outcomes are shown below with apprenticeship grading equivalence. These typically are as follows:

<table>
<thead>
<tr>
<th>Degree Award Class</th>
<th>Grading Equivalence</th>
<th>Marks Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-class Honours (1st)</td>
<td>Distinction</td>
<td>70+</td>
</tr>
<tr>
<td>Second-class Honours, upper division (2:1)</td>
<td>Merit</td>
<td>60–69</td>
</tr>
<tr>
<td>Second-class Honours, lower division (2:2)</td>
<td>Pass</td>
<td>50–59</td>
</tr>
<tr>
<td>Third-class Honours (3rd)</td>
<td>Pass</td>
<td>40–49</td>
</tr>
</tbody>
</table>

3. Assessment responsibilities and quality assurance

Assessment responsibilities are set out in Appendix 3. The university will use a programme delivery team of lecturers and tutors to deliver and assess the programme. This will be done in collaboration with employers. It is the responsibility of universities to appoint module lecturers with the right mix of skills and experience to undertake assignment setting and assessment, who command the credibility and respect of employers and apprentices and in accordance with the universities guidelines.

Universities are responsible for ensuring that assignments that contribute to module assessments are examined in a consistent way and that the judgements reached are comparable and reliable.

*Independence and impartiality of assessment*

Universities have extremely robust assessment processes and approaches that ensure independence. The overall governance across the degree programme’s formative and end point synoptic assessments is achieved through the use of independent external examiners. The system of external examining is a distinctive feature of Higher Education in the UK. All degree programmes delivered in Higher Education Institutions in the UK will have an external examiner. External examiners are independent experts appointed from other academic institutions. They are suitably qualified to provide subject and academic advice on the academic standards of the degrees or other awards, to which they have been assigned. They independently assure quality through their following responsibilities:

- to evaluate all forms of assessment (including formative and end point synoptic) which contribute to students’ degree results;
- to evaluate, and help ensure fairness and consistency in the assessment process;
- to moderate summatively assessed work at module and programme level;
- to comment on draft examination papers and assessment tasks as appropriate;
- to report on the structure, content, academic standards and teaching of programmes;
- to comment, if invited to do so, on any alleged cases of assessment irregularities.
They will review the programme, its modules, teaching materials, student feedback and especially the assessment methods as well as samples of student assessment work across modules. They ensure fair and consistent moderation and to confirm that marking standards are comparable with standards across UK Higher Education. If an external examiner is concerned about accuracy and consistency of marking within a sample of student work, all work within that particular module may be re-marked.

The external examiner also attends the Module and programme Assessment Boards to review the distribution of marks across modules and identify any issues or aspects of good practice.

Each external examiner submits an annual written report at the end of the academic year. This report is based on what the examiner has observed of the University’s assessment processes and on samples of student work they have seen. These reports provide invaluable independent feedback to the University at module and/or programme level.

These duties are consistently undertaken in relation to the academic standards of HEIs, and will relate to internal and external reference points, including the digital & technology solution professional standard and assessment plan.

Within modules there are also robust quality assurance procedures. These include setting clear assessment and grading criteria for students, and the use of independent moderators who:

- appraise the set module assessments to ensure they are appropriate;
- review the assessment marking;
- undertake sample marking against the assessment criteria.

Employers will contribute to the assessment of the synoptic project and presentation against the standard. This will include the employer contributing a short written report of the apprentices’ project performance against defined assessment criteria and of the project report. They will also attend the presentation and provide input to the assessment of the project presentation. Whilst the ideal is for the presentation to take place in front of a combined audience of the host university and employer, in practice students may be required to give a separate presentation to their employer and university.

4. Affordability

The approach presented offers an affordable and scalable solution to assessment for this apprenticeship. Universities are extremely capable in delivering project based assessment that represents the application of a student’s skills, knowledge and behaviours. In this context the capstone synoptic project is set against the specification of the standard and will be validated by built in employer contribution to the assessment.
## Formative Assessment Approaches

<table>
<thead>
<tr>
<th>Area of competence</th>
<th>Typical Assessment Criteria</th>
<th>Typical Assessment Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Systems:</td>
<td>• Organisational structure chart</td>
<td>- Develop, document and submit well-reasoned investment and service management, including solutions to emerging opportunities. - Publish, manage and coordinate the implementation of solutions, ensuring that stakeholders are involved and feedback is collected.</td>
</tr>
<tr>
<td>Systems Development:</td>
<td>• Review of specification</td>
<td>- Identify and evaluate potential benefits of solutions and services, including the evaluation of potential solutions, their cost and potential benefits to the organisation. - Develop and implement well-reasoned investment and service management, including solutions to emerging opportunities.</td>
</tr>
<tr>
<td>Data:</td>
<td>• Review of data requirements</td>
<td>- Identify and evaluate potential benefits of solutions and services, including the evaluation of potential solutions, their cost and potential benefits to the organisation. - Develop and implement well-reasoned investment and service management, including solutions to emerging opportunities.</td>
</tr>
<tr>
<td>Cyber Security:</td>
<td>• Threat analysis</td>
<td>- Identify and evaluate potential benefits of solutions and services, including the evaluation of potential solutions, their cost and potential benefits to the organisation. - Develop and implement well-reasoned investment and service management, including solutions to emerging opportunities.</td>
</tr>
<tr>
<td>Business Organisation:</td>
<td>• Business plan</td>
<td>- Identify and evaluate potential benefits of solutions and services, including the evaluation of potential solutions, their cost and potential benefits to the organisation. - Develop and implement well-reasoned investment and service management, including solutions to emerging opportunities.</td>
</tr>
<tr>
<td>Computer and Network Infrastructure</td>
<td>IT Project Management</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>IT Project Management</strong></td>
<td><strong>Computer and Network Infrastructure</strong></td>
<td></td>
</tr>
<tr>
<td>Clear design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context. Identifies network security risks and their remediation.</td>
<td>Can plan, design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context.</td>
<td></td>
</tr>
<tr>
<td>Network scope and methodology</td>
<td>Defined escalation process and mitigation</td>
<td></td>
</tr>
<tr>
<td>Clear design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context. Identifies network security risks and their remediation.</td>
<td>Defined escalation process and mitigation</td>
<td></td>
</tr>
<tr>
<td>Activity estimates</td>
<td>Project scope and methodology</td>
<td></td>
</tr>
<tr>
<td>Accurate network dimensioning report</td>
<td>Project plan</td>
<td></td>
</tr>
<tr>
<td>Clear scoping report identifying project deliverables, the project domain and the elected methodology being used</td>
<td>Clear scoping report identifying project deliverables, the project domain and the elected methodology being used</td>
<td></td>
</tr>
<tr>
<td>Well reasoned activity estimates</td>
<td>Clear design that meets the specification</td>
<td></td>
</tr>
<tr>
<td>Accurate network dimensioning report</td>
<td>Well structured network plan</td>
<td></td>
</tr>
<tr>
<td>Clear design and meets the specification</td>
<td>Well structured network plan</td>
<td></td>
</tr>
<tr>
<td>Effective delivery and managing the infrastructure identified in the domain and the outcomes defined</td>
<td>Well reasoned network availability targets</td>
<td></td>
</tr>
</tbody>
</table>

Business performance outcomes of various investment proposals on: Clean value analysis showing the impact Statement to be agreed to account of all costs and delivering the associated investment proposal taking and the outcomes defined. Value analysis and the outcomes desired.
<table>
<thead>
<tr>
<th>Area of competence</th>
<th>Knowledge Outcome Required</th>
<th>Typical Assessment</th>
<th>Assessment Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business</strong></td>
<td>Why technology is important to business and society.</td>
<td>Review of technology impact</td>
<td>Identify the importance of legacy technology systems in their organisation and how new technology environments might affect them.</td>
</tr>
<tr>
<td></td>
<td>How strategic decisions are made concerning acquiring technology solutions resources and capabilities including the ability to evaluate the different sourcing options</td>
<td>Evaluation of solution development methodologies and techniques</td>
<td>Recognising the importance of legacy technology systems in their organisation and how new technology environments might affect them.</td>
</tr>
<tr>
<td></td>
<td>How business exploits technology solutions for competitive advantage vs necessity</td>
<td>Case study review</td>
<td>Technology make or buy decisions</td>
</tr>
<tr>
<td></td>
<td>The value of technology systems investments and how to formulate a business case for a new technology solution, including estimation of both costs and benefits</td>
<td>Exam or in module test question</td>
<td>Identifying key processes</td>
</tr>
<tr>
<td></td>
<td>Contemporary techniques for design, developing, testing, correcting, deploying and documenting software systems from specifications, using agreed standards and tools</td>
<td>Evaluation of solution development methodologies and techniques</td>
<td>Technology make or buy decisions</td>
</tr>
<tr>
<td></td>
<td>The role and position of legacy technology systems in organisations and how new technology environments interface and integrate with them</td>
<td>Appraisal of the use of legacy systems</td>
<td>Recognising the importance of legacy technology systems in their organisation and how new technology environments might affect them.</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>The alignment between organisational strategy and technology strategy</td>
<td>Case study review</td>
<td>Technology make or buy decisions</td>
</tr>
<tr>
<td></td>
<td>How business exploits technology solutions for competitive advantage vs necessity</td>
<td>Case study review</td>
<td>Technology make or buy decisions</td>
</tr>
<tr>
<td></td>
<td>The difference between organisational strategies and technology strategies</td>
<td>Case study review</td>
<td>Technology make or buy decisions</td>
</tr>
<tr>
<td></td>
<td>Information systems’ and organisational components of the technology people and organisational components of society</td>
<td>Review of technology impact</td>
<td>Why technology is important to business and society.</td>
</tr>
<tr>
<td><strong>Assessment Criteria</strong></td>
<td>Typical Assessment</td>
<td>Requirements:</td>
<td></td>
</tr>
<tr>
<td>Project</td>
<td>Reflective report</td>
<td>Review report</td>
<td>Exam or in module last question</td>
</tr>
<tr>
<td>---------</td>
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<td>-------------------------------</td>
</tr>
<tr>
<td>Identify key stages in project planning</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Describe the main networking technologies and their purpose</td>
</tr>
<tr>
<td>Describe the main networking technologies and their purpose</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Identify the main features</td>
</tr>
<tr>
<td>Identify the main features</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Describe the main features of a data model and data solution</td>
</tr>
<tr>
<td>Describe the main features of a data model and data solution</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Identify the features of a data model and data solution</td>
</tr>
<tr>
<td>Identify the features of a data model and data solution</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Describe the main features of standard network protocols including HTTPS, SMTP, SNMP, TCP, IP, etc.</td>
</tr>
<tr>
<td>Describe the main features of standard network protocols including HTTPS, SMTP, SNMP, TCP, IP, etc.</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Recognise the main features of a data management system</td>
</tr>
<tr>
<td>Recognise the main features of a data management system</td>
<td>Reflective report</td>
<td>Exam or in module last question</td>
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</tr>
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<td>Reflective report</td>
<td>Exam or in module last question</td>
<td>Identify the features of a data model and data solution</td>
</tr>
</tbody>
</table>
### Reflective report

List the factors and identify issues that may arise in the day-to-day operation of networks.

<table>
<thead>
<tr>
<th>Area of competence</th>
<th>Knowledge Outcome Required</th>
<th>Typical Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional, interpersonal and business skills</td>
<td></td>
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</tr>
</tbody>
</table>

### C - Assessing the Core Behavioural Skills

<table>
<thead>
<tr>
<th>Attributes and Values</th>
<th>Typical Assessment</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

| peer assessment | | |
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| | | |

| Team organised and clear distribution of roles to achieve target outcomes | | |
| | | |
| | | |
| | | |

| Well constructed course presentation | | |
| | | |
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| | | |

| Solution design | | |
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| | | |

| SWOT analyses | | |
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| | | |

| Team based project report | | |
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| | | |

| Presentation | | |
| | | |
| | | |
| | | |

| | **Team based project** |
| | **SWOT analysis** |
| | **Report** |
| | **Presentation** |

| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Team organised and clear distribution of roles to achieve target outcomes** |
| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Team organised and clear distribution of roles to achieve target outcomes** |
| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |

| | **Team organised and clear distribution of roles to achieve target outcomes** |
| | **Well constructed course presentation** |
| | **Solution design** |
| | **SWOT analysis** |
| | **Team based project report** |
| | **Presentation** |
Flexible attitude
Ability to perform under pressure
A thorough approach to work
Logical thinking and creative approach to problem solving

Appendix 2 – Digital & Technology Solutions: Professional – Synoptic Project Competence Outcomes:

<table>
<thead>
<tr>
<th>Area of competence</th>
<th>Typical Project Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Analyst</td>
<td>Apply structured processes for identifying, defining and analysing unstructured business problems, their root cause and impact.</td>
</tr>
<tr>
<td>IT Consultant</td>
<td>Perform technical, organisational, and process improvement tasks in a range of environments to solve business problems.</td>
</tr>
<tr>
<td>Software Engineer</td>
<td>Engineer software solutions to address specific business needs, including software development, testing, and deployment.</td>
</tr>
</tbody>
</table>

Business Analyst:
- Apply structured processes for identifying, defining and analysing unstructured business problems, their root cause and impact.
- Analyse current state with models.
- Problem definition.
- Requirements engineering.
- Solution models.
- Business process models.
- Clear business requirements.
- Well documented solution.
- Solution delivery.

IT Consultant:
- Perform technical, organisational, and process improvement tasks in a range of environments to solve business problems.
- Business process models.
- Solution proposal and target state models.
- Integration issues.
- Make or buy and procurement decisions.
- Benefits analysis.
- Clear business requirements.

Software Engineer:
- Engineer software solutions to address specific business needs, including software development, testing, and deployment.
- Use software development processes, including planning, design, implementation, testing, and deployment.
- Ensure software solutions are fit for purpose and meet the requirements of the business.
- Apply appropriate software development methodologies.
- Ensure software solutions are secure and meet security requirements.
- Ensure software solutions are maintainable and supportable.
- Ensure software solutions are scalable and extensible.
- Ensure software solutions are efficient and performant.
- Ensure software solutions are reliable and resilient.
- Ensure software solutions are maintainable and development.
- Ensure software solutions are scalable and extensible.

Typical Project Outcomes:
- Logical thinking and creative approach to problem solving.
- A thorough approach to work.
- Ability to perform under pressure.
- Flexible attitude.
### Cyber Security Analyst

- Analyse and evaluate security threats
- Identify how these can be mitigated against
- This could be an analysis of a given domain and evaluation of security threats and vulnerabilities to planned and installed information systems or services with a robust cyber security solution.

**Analysis of network domain**
- Identification of information assets
- Threat assessment
- Description of assessment methodology
- Recommendations

**Data Analyst**

- Use a range of analytical techniques such as data mining, time series analysis and predictive analytics to identify and predict trends and patterns in data.
- This could be a project to analyse, devise and deploy data analytics solutions for a real-world problem domain.

**Network Engineer**

- Plan, design, build and test a simple network to meet a defined specification, to satisfy security requirements, using one or more of the defined tools, to meet specified criteria and performance levels. It will include significant project planning including estimations of both time and cost to proposed solutions, including significant project planning including estimations of both time and cost to proposed solutions.

**Analysis of network domain**
- Present findings
- Visualise data
- Analyse data using a range of standard analytical techniques
- Collect, clean and extracts data

<table>
<thead>
<tr>
<th>Products and Processes</th>
<th>Network Engineers</th>
<th>Data Analyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applying appropriate security and wireless data devices that includes hubs, switches, routers and a defined specification to a network to a requirement specification</td>
<td>Plan, design, build and test a simple network to meet a defined specification, to satisfy security requirements, using one or more of the defined tools, to meet specified criteria and performance levels. It will include significant project planning including estimations of both time and cost to proposed solutions, including significant project planning including estimations of both time and cost to proposed solutions.</td>
<td>Use a range of analytical techniques such as data mining, time series analysis and predictive analytics to identify and predict trends and patterns in data. This could be a project to analyse, devise and deploy data analytics solutions for a real-world problem domain.</td>
</tr>
</tbody>
</table>

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### Appendix 3 – Assessment Responsibilities

#### 1. Summary of roles in relation to formative module assessment

<table>
<thead>
<tr>
<th>Role</th>
<th>Preparation</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprentice</td>
<td>• Prepares by fully reviewing the assignment brief and assessment criteria</td>
<td>• Submits required work to be assessed</td>
</tr>
<tr>
<td></td>
<td>• Is clear on the submission process and due date</td>
<td></td>
</tr>
<tr>
<td>Employer</td>
<td>• Advises the apprentice on assignments that can be undertaken either within</td>
<td>• Contributes to formative assessment using the defined assessment criteria</td>
</tr>
<tr>
<td></td>
<td>the workplace or using workplace scenarios</td>
<td>• Contributes to the capstone project assessment, against the defined criteria</td>
</tr>
<tr>
<td></td>
<td>• Permits evidence of commercial value to be included</td>
<td>• Attends the presentation and contributes to the assessment</td>
</tr>
<tr>
<td></td>
<td>• Provides access to resources required</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>• Produces module assessment schedule to guide apprentice and employer</td>
<td>• Assesses the work submitted as part of the module assessment</td>
</tr>
<tr>
<td></td>
<td>• Produces individual assessment brief and assessment marking criteria</td>
<td>• Produces feedback on each assessment</td>
</tr>
<tr>
<td></td>
<td>• Advises the apprentice on the assessment brief</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Advises the employer on opportunities to conduct assignments in the workplace</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Provides guidance and support to the apprentice on their module assignments</td>
<td></td>
</tr>
<tr>
<td>External Examiner</td>
<td>• Independently reviews the programme, its modules and samples of teaching materials</td>
<td>• Independently reviews samples of student work by module</td>
</tr>
<tr>
<td></td>
<td>• Independently reviews all formative assessments set</td>
<td>• Independently reviews samples of completed marking</td>
</tr>
</tbody>
</table>

#### 2. Summary of roles in relation to the synoptic project

<table>
<thead>
<tr>
<th>Role</th>
<th>Preparation</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprentice</td>
<td>• Has completed all portfolio and formative outcomes</td>
<td>• Completes and submits project terms of reference and an initial project plan</td>
</tr>
<tr>
<td></td>
<td>• Agrees project title with employer and university</td>
<td>• Undertakes the project and prepares and submits the project report</td>
</tr>
<tr>
<td></td>
<td>• Plans the project</td>
<td></td>
</tr>
<tr>
<td>Employer</td>
<td>• Agrees to provide the apprentice with suitable time to complete those parts</td>
<td>• Completes an assessment of the final project report using defined assessment criteria</td>
</tr>
<tr>
<td></td>
<td>of the project that are not part of their normal job</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• With the University and apprentice agrees the project title and commits to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>any associated resource requests</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>• Advises the apprentice on requirements for synoptic assessment</td>
<td>• Responsible for arranging and managing the delivery of the synoptic project to ensure defined conditions are satisfied (aspects of which may be delegated to the employer)</td>
</tr>
<tr>
<td></td>
<td>• Reviews practical arrangements for the project to ensure that the apprentice can achieve the desired outcomes</td>
<td></td>
</tr>
</tbody>
</table>
3. Summary of roles in relation to the synoptic presentation

<table>
<thead>
<tr>
<th>Role</th>
<th>Preparation</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apprentice</strong></td>
<td>• Re-familiarises her/himself with the summative portfolio and synoptic project</td>
<td>• Responds to the university module teams questions</td>
</tr>
<tr>
<td></td>
<td>• Identifies positive aspects of the portfolio and synoptic project to highlight</td>
<td>• Provides further information as requested</td>
</tr>
<tr>
<td></td>
<td>• Gathers any other documents they may want to draw on</td>
<td></td>
</tr>
<tr>
<td><strong>Employer</strong></td>
<td>• Advises the apprentice on which aspects of their recent work to highlight</td>
<td>• Contributes to the assessment of the project presentation</td>
</tr>
<tr>
<td></td>
<td>• Allows time off work for the presentation</td>
<td>• Provides an appropriate venue if required</td>
</tr>
<tr>
<td><strong>University</strong></td>
<td>• Advises the apprentice on which aspects of the evidence may be probed/explored and how to respond</td>
<td>• Puts the apprentice at ease</td>
</tr>
<tr>
<td></td>
<td>• Organises the time and place</td>
<td>• Probes/explores aspects of evidence and quality of the apprentice’s work</td>
</tr>
<tr>
<td></td>
<td>• Identifies aspects of the apprentice’s work in the synoptic project and summative portfolio to be probed/explored</td>
<td>• Assesses the apprentice’s responses</td>
</tr>
<tr>
<td><strong>External Examiner</strong></td>
<td>• Independently reviews the presentation scope, assessment criteria and schedule</td>
<td>• Records key points about the apprentice’s responses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Uses the additional evidence gained from the apprentice to inform the grading decision</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Independently reviews student presentations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Independently reviews samples of completed presentation marking to ensure consistency and quality.</td>
</tr>
</tbody>
</table>
Appendix 11

Embedded Electronic Systems Design and Development Apprenticeship Standard

Occupation: Embedded Electronic Systems Design and Development Engineer

The role of the Embedded Electronic Systems Design and Development Engineer is to apply their knowledge of electronics and of embedded software to the design of circuits or devices that provide a useful function, that are capable of being manufactured at a competitive cost, and that are reliable and safe in use. This involves the use of the engineer’s knowledge of electronics and electronic principles, married to an expertise in the end use of the final product. In electronics this end use can cover a wide spectrum. Examples of industrial sectors that rely heavily on Embedded Systems Design and Development Engineers include Aerospace, Automotive, Automation and Instrumentation, Robotics, Telecommunications, Information and Computer Technology, Defence, Energy (including renewables), Transport and Consumer Electronics. The role provides the basis of learning with potential to specialise as a Hardware Engineer, Software engineer or Systems Engineer in these sectors and can extend from design of integrated circuits through to complete systems.

Embedded Electronic Systems Design and Development Engineers will spend their careers in these industries developing the next generations of products such as smartphones, electric vehicles, communications satellites, smart grids and bringing concepts such as smart cities into reality. For others, an initial grounding in design and development will prove an excellent launch pad for a career in applications engineering, product management, marketing or general management.

The Embedded Electronic Systems Design and Development Engineer must be proficient in a wide range of skills, underpinned by academic understanding, to enable them to work across these sub-sectors and specialisms.

Apprentices will complete a Degree that will support the fundamental scientific and mathematical principles that equip them with the understanding required to operate effectively and efficiently at a high level within any of these sectors. This will be supported by vocational training to develop the required competencies specific to particular roles within the chosen sectors.

Requirements:

A competent Embedded Electronic Systems Design and Development Engineer will meet the following requirements:

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical circuit theory</td>
<td>Understanding of basic electrical theory</td>
</tr>
<tr>
<td>Electronic components</td>
<td>Knowledge of the method of operation of basic semiconductors and passive components including their most common uses. Also the basic formulas used in their application</td>
</tr>
<tr>
<td>Analogue and digital design techniques</td>
<td>Understanding of design of both analogue and digital circuits and the basic design rules for mixed analogue and digital circuit boards</td>
</tr>
<tr>
<td>Structured software</td>
<td>Comprehension of the fundamentals of structured software design</td>
</tr>
<tr>
<td>Company Specifics</td>
<td>Understanding key aspects of the employer’s business and product applications – against a template to be generated by the employer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit design</td>
<td>Design functional electronic systems and circuits from component level</td>
</tr>
<tr>
<td>Circuit layout</td>
<td>Utilise modern CAD technology to implement circuit design with understanding of considerations for heat dissipation, electrical interference and other industry specific considerations affecting layout</td>
</tr>
<tr>
<td>Structured programming for embedded software</td>
<td>Write and document structured code to comply with industry norms and to allow others to understand and subsequently maintain/modify the code</td>
</tr>
<tr>
<td>Mathematical modelling</td>
<td>Utilise modelling techniques for circuit design, embedded software development and thermal management</td>
</tr>
<tr>
<td>Design for purpose</td>
<td>Ability to demonstrate an understanding of the principles and practice of design for market, design for manufacturability, design for testability and design for maintainability</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Testing methodology</th>
<th>Ability to develop a test plan for a product that they have developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product transition into production</td>
<td>Ability to explain the process by which a product is introduced into production, including what aspects are discussed at what stage and with whom and how development gateways work</td>
</tr>
<tr>
<td>Project Management</td>
<td>Ability to develop a basic project plan including resource planning, time planning, use of contingencies etc. Also techniques for predicting pinch points and strategies for timescale recovery</td>
</tr>
<tr>
<td>Compliance</td>
<td>Awareness of international standards and compliance requirements for the products designed by the employer. Ability to discuss the differences between legislative and non-legislative requirements</td>
</tr>
<tr>
<td>Commercial awareness</td>
<td>Ability to demonstrate knowledge of basic business fundamentals including costs, overheads, gross margin, net margin, profit, and cash</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Ability to demonstrate awareness and understanding of basic health and safety principles both in the general workplace and specific to electronic circuit design</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behaviours</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Self-starter, organised thinker. Works safely and effectively without close supervision</td>
</tr>
<tr>
<td>Communication</td>
<td>Confident in oral, written and electronic methods. Ability to communicate effectively with all levels of stakeholder</td>
</tr>
<tr>
<td>Team ethos and leadership</td>
<td>Exhibits leadership behaviour and qualities. Demonstrable ability to work as a member of a team.</td>
</tr>
<tr>
<td>Continuous development</td>
<td>Committed to personal learning and development</td>
</tr>
<tr>
<td>Problem solving/practicality</td>
<td>Enjoys problem solving. Able to demonstrate practical capabilities in their professional role.</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Accepts responsibility for own work and that of others</td>
</tr>
<tr>
<td>Ethics and professional standards</td>
<td>Exercises responsibilities in an ethical manner and respects and complies with company rules and guidelines. Able to commit to beliefs, goals, and standards of their employer and the wider industry and its professional standards</td>
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</tbody>
</table>

**Duration:**

The duration of this apprenticeship is unlikely to be less than 36 months.

**Entry Requirements:**

Individual employers will set their own entry requirements in terms of prior academic qualifications and experience. Typically candidates will have attained A-Level standard or equivalent, in Maths and at least one further STEM based subject such as Physics, ICT, Computing or Electronics and will have English Language at GCSE (grade C or above).

**Level:**

The Apprenticeship Standard is at Level 6.

**Qualifications:**

An Honours Degree in Electronics or Electrical & Electronic Engineering which has been accredited by one of the Professional Engineering Institutions licensed by the UK Engineering Council.

Apprentices without a Level 2 English and maths must complete this prior to taking the end-point assessment.

**Professional Registration:**

Completion of the Apprenticeship will be recognised by the relevant Professional Engineering Institutions.

**Review:**

The standard will be initially reviewed after three years to ensure it reflects employer demand for changes in the syllabus.

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Appendix 12

Embedded Electronic Systems Design and Development Assessment Plan

Assessment Plan
Embedded Electronic Systems Design and Development Engineer
Level 6 Degree Apprenticeship
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May need renumbering after amendments agreed.

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1. Introduction

The Embedded Electronic Systems Design and Development Engineer Apprenticeship typically takes three years or more to complete. It provides a pathway to acquire personal and professional skills and competencies as identified in the Standard (attached as Annex 2).

These are commensurate with those identified in the Engineering Council’s UK Standard for Professional Engineering Competence (UK-SPEC) (http://www.engc.org.uk/ukspec.aspx), required in order to register as an Engineering Technician (EngTech), an Incorporated Engineer (IEng) or Chartered Engineer (CEng). Aligning the Standard to the UK-SPEC in this way ensures consistency across the UK and also parity with the existing professional workforce, as well as paving the way for membership of a Professional Engineering Institution (PEI).

An academic award of BSc or BEng Honours Degree, as accredited by a PEI such as The Institution of Engineering and Technology (IET) or The Institute of Measurement and Control (InstMC), will form part of the apprenticeship and underpins workplace occupational competency in a range of high skill industries in a range of rôles, for example:

- Software Engineer;
- Electrical / Electronic Engineer; or
- Systems Engineer.

As well as being suitable for school leavers as an alternative route to gaining a degree, this qualification will strengthen the vocational pathway and be a suitable route for existing apprentices to follow in order to progress further in their chosen career.

Apprentices on this scheme will progressively develop the knowledge, skills and behaviours necessary to become well-rounded engineers; observing a professional code of conduct, with the right professional skill sets required to operate effectively in a wide range of engineering environments at the forefront of UK Engineering.

The proportion and distribution of time spent on academic and vocational education and training will vary according to the HEI and employer but will in all cases be sufficient for the achievement of the Knowledge, Skills and Behaviours (KSBs) as detailed in the Standard.

2. Summary of Assessment / Overview

The assessment of this apprenticeship will include both on-programme assessment and a synoptic, end-point assessment. This document concentrates on the synoptic, end-point
assessment but for clarity and completeness, makes mention of the on-programme assessment.

To protect employers’ Intellectual Property Rights (IPR) at all times, any issues for assessment of material relating to company IPR, confidentiality and/or security will be addressed between the HEI, the employer and the apprentice, prior to the course commencement, or, as soon as possible when they arise, to avoid disadvantaging the apprentice.

Where possible, Non-Disclosure Agreements, (NDAs), allowing projects and tasks with business value to be undertaken using real data will be used.

Completion of the apprenticeship will be by end-point assessment which will look holistically at the KSBs developed to determine if the requirements of the Standard have been met.

2.1 On-programme Assessment

2.1.1 Degree

Any Honours Degree in Electronics or Electrical & Electronic Engineering which has been accredited by one of the Professional Engineering Institutions licensed by the UK Engineering Council and offered by a UK university is acceptable for this apprenticeship.

The greater part of the on-programme assessment will be carried out by the HEI, during the delivery and final examination of the Bachelor’s Degree.

The assessment approach to the academic element is designed to ensure that apprentices meet both the academic level of knowledge required for the award of the degree undertaken, as well as the skills, knowledge and behavioural outcomes defined in the Standard, allowing them to seek immediate registration as a professional engineer, should they so wish, regardless of which HEI is delivering the programme.

The award issued to apprentices by an HEI is verification that the academic part of the Standard has been met and graded. HEIs will therefore need to work with the PEI to accredit the designed course - many existing degree courses, already accredited, will be used as the academic part of this apprenticeship. This apprenticeship does not require HEIs to make adjustments to either the way in which the degree course is delivered nor the way in which it is assessed.

HEIs should ensure that appropriate assessment of employer identified specialist subjects is included. It is likely that on-programme assessment will include...
assignments containing essays, reports, completion of practical tasks and work-based projects, calculations, tests and formal examinations.

HEIs have robust and well established assessment and quality assurance processes, incorporating internal moderation and external examiners to ensure independence across the degree programme and consistency between HEIs.

Passing the degree course will be one of the elements of a gateway to moving on to the end-point assessment. In the event of failure to pass the degree course, completion of the apprenticeship cannot be achieved.

2.1.2 Log Book

The apprentice will complete an individual portfolio of vocational evidence, a Log Book, in order to be able to demonstrate competence in all of the KSBs required for successful completion of this apprenticeship

Whilst it may be either paper or digital media based, it should collate evidence of all tasks undertaken and progress made over the duration of the apprenticeship. The evidence collated in the Log Book will be recorded against each of the KSBs in the Standard and be mapped to the requirements of the UK-SPEC for professional registration. It will also provide evidence of evaluation and feedback from supervisors and management.

The Log Book should contain sufficient evidence / information for the employer to make the end-point assessment of occupational competence and for the independent end-point assessors to judge professional competence.

The Log Book will be developed by the PEI to ensure that a consistent standard is achieved across employers. This process will also specify what level of information should be recorded to be seen as sufficient evidence of each KSB being achieved.

Similar Log Books have already been designed for other engineering sector apprenticeships which have been developed under the Trailblazer programme. It would make sense for an element of standardisation for this type of document to be applied where possible across engineering sectors rather than have many dissimilar styles, layouts and formats. The adaptation and use of existing Log Books and associated documentation for this Embedded Electronic Systems Design and Development Engineer Apprenticeship is therefore recommended.

An example of a Log Book associated with a different apprenticeship is attached as Annex 3, purely for illustrative purposes. This is not the Log Book that will be used for this apprenticeship.
2.1.3 Vocational Training

In order for the apprentice to be able to demonstrate acquisition of competence in the KSBs, it is likely that various training and education activities will be undertaken during the apprentice’s time spent in-company. These may well differ between employers: for example, a large company may be able to move an apprentice between departments of the business to ensure this, whereas a small company may have to purchase external training from specialist third-party training providers.

Examples might include external, Institute of Learning and Management courses with associated Certificates and Diplomas, or internal Six Sigma, Lean or Team working courses. The Standard also mandates that ability in areas such as motivation and ethics should be an integral part of this apprenticeship. This may entail formal or informal training schemes and again be either internally or externally run.

Any formal qualifications gained will be recorded as part of the written evidence in the Log Book.

2.2 End-point Assessment

The end-point assessment is the final assessment of the Embedded Electronic Systems Design and Development Engineer Apprenticeship and a successful assessment will mark completion of the apprenticeship.

The end-point assessment will be in two phases. The first will take the form of examination by interview between the employer, an appropriately qualified individual appointed by the assessment organisation and the apprentice, of the evidence presented in the completed Log Book to determine the occupational competence of the apprentice. It is unlikely that this interview will take less than 2 hours.

The second phase will comprise submission of the Log Book to the PEI. The PEI will appoint an independent assessment panel comprised of a minimum of two appropriately qualified professional engineers, ones holding an IEng or CEng qualification. One member of the panel will be appointed as Chair of the panel and will carry the deciding vote.

This panel will assess the professional competence of the apprentice.

Successful completion of this second phase marks successful completion of the apprenticeship.
2.3 Apprenticeship Flow Diagram

The flow of the elements leading to the completion of the apprenticeship is shown below in figure 1.

![Apprenticeship Flow Diagram]

Figure 1 - Apprenticeship Flow Diagram

3. Professional Qualifications

An academic award of BSc or BEng Honours Degree, as accredited by a PEI such as The Institution of Engineering and Technology (IET) or The Institute of Measurement and Control (InstMC).
Passing the degree course will be one element of the gateway to moving on to the end point assessment. In the event of failure to pass the degree course the apprenticeship cannot be achieved.

4. On-programme Assessment

On programme assessment will principally be carried out by the HEI during the delivery and assessment of the degree course element of the apprenticeship.

On-programme vocational and behavioural training will also be undertaken and assessed.

5. Assessment Gateway

As a prerequisite to the end-point assessment, the apprentice will need to have achieved:

- an accredited BSc or BEng Honours Degree;
- completion of the Log Book; and
- Maths and English level 2.

6. End-point Assessment in detail

The Embedded Electronic Systems Design and Development Engineer Apprenticeship Standard contains a table detailing all of the Knowledge, Skills and Behaviours which must be acquired by the apprentice, along with detail of what is required for each topic area and how it will be assessed.

This table is included below as Annex 1 Table of Knowledge, Skills and Behaviours.

Those elements of the KSBs shown in Annex 1 to be assessed as part of the end-point assessment will be evidenced in detail in the Log Book.

6.1 Log Book

Collated over the duration of the apprenticeship, each apprentice will prepare a supporting portfolio of evidence, the Log Book. This Log Book will enable the apprentice to demonstrate to the employer and the assessment panel, the specific work related tasks that they have completed in order to demonstrate how they have achieved both occupational and professional competence as set out in the Standard.

The Log Book will also give the apprentice the opportunity to demonstrate to the employer that they understand the company in terms of their products, processes,
procedures, tools, equipment, materials, documentation and information systems by showcasing what they have done, what they have learnt and how they have applied this knowledge and skills to real work tasks including solving engineering related problems.

The Log Book of evidence will show how the apprentice has demonstrated the knowledge, skills and behaviours required to be a competent Embedded Electronic Systems Design and Development Engineer.

The Log Book will also contain sufficient, valid and reliable evidence which is cross-referenced to the professional competence requirements for an Incorporated Engineer (IEng) as specified in the UK-SPEC.

The Log Book will include as a minimum, examples of competent performance evidence that must include products of the apprentice’s work, together with evidence of the way the apprentice carried out the activities to meet the requirements of the Standard, such as assessor observations, supervisor/mentor references/witness testimonies or authenticated apprentice reports of the activities undertaken.

A Log Book template will be developed by the PEI to ensure that a consistent standard is achieved across employers. This process will also specify what level of information should be recorded to be seen as sufficient evidence of each KSB being achieved.

An example of a Log Book associated with a different apprenticeship is attached as Annex 3, purely for illustrative purposes. This is not the Log Book that will be used for this apprenticeship.

6.2 Occupational Competence Interview

The first phase of the end-point assessment, the Occupational Competence Interview is an interview focused on all the components of the Apprenticeship Standard, which will enable the employer to validate the apprentices’ occupational competence.

It is a structured and formal discussion between the apprentice and their employer and an appropriately qualified independent assessor appointed by the assessment organisation, drawing upon a portfolio of evidence, the Log Book, and records of how the apprentice has performed during the Apprenticeship. It covers both what tasks the apprentice has completed in the workplace, the standard of their work, and the behaviours they have demonstrated throughout, such as, being a team player, exhibiting leadership qualities, being a responsible employee and being self-motivated.
This enables the end-point assessment to cover a broad range of knowledge, skills and behaviours, as are detailed in the Standard. It is unlikely that this interview will take less than 2 hours and the deciding vote will be held by the independent assessor. The independent assessor may be present at the face-to-face interview or take part via a remote video / audio link.

The interview will also provide an opportunity to:

- clarify any points and/or probe the apprentice on the evidence they have presented in their portfolio;
- confirm and validate that the portfolio of evidence is the apprentices own work;
- confirm and validate the judgements about the quality of the work the apprentice has completed;
- test the behaviours of the apprentice;
- explore particular areas of work presented in the portfolio, how it was carried out, any problems that they encountered and how these were resolved; and
- validate the apprentice’s skills and knowledge and understanding of key aspects of the company.

If, following the interview the employer and independent assessor judge that the apprentice is not yet fully occupationally competent, the apprentice and the employer will develop a CPD plan to enable the apprentice to develop the additional competencies/experience required to achieve full occupational competence.

To ensure a consistency of approach, guidance documents on both the structure of the Occupational Competence Interview and also how this should be carried out will be developed by the PEI.

Note: Before the Occupational Competence Interview can take place, the employer must have evidence that the apprentice has completed and will be awarded the mandatory academic qualification, the Bachelor’s degree.

6.3 Professional Competence Assessment

This is the second phase of the end-point assessment and will be carried out by submission of the Log Book to the PEI. The PEI will appoint an independent assessment panel comprised of a minimum of two appropriately qualified professional engineers, ones holding an IEng or CEng qualification. One member of the panel will be appointed as Chair of the panel and will carry the deciding vote.

On successful completion of the Occupational Competence Interview the completed Log Book and any supporting evidence, will be sent to the PEI to assess the apprentice’s professional competence.
The KSBs of the Standard will be mapped against the 5 UK-SPEC Incorporated Engineer (IEng) competency areas by the PEI. These are:

- Use a combination of general and specialist engineering knowledge and understanding to apply existing and emerging technology.
- Apply appropriate theoretical and practical methods to design, develop, manufacture, construct, commission, operate, maintain, decommission and re-cycle engineering processes, systems, services and products.
- Provide technical and commercial management
- Demonstrate effective interpersonal skills
- Demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment

The professional competence of the apprentice can then be judged against these 5 areas.

For a pass to be awarded, the apprentice must demonstrate that all the KSBs of the Standard have been fully achieved.

Relevant PEIs will work collaboratively taking guidance from the Employer Group, to produce a common approach to assessing the apprentices’ evidence as detailed in the Log Book. This approach will explain how the evidence will be assessed and the detail will be made freely, publicly available in order to assist both the apprentice and the employer to fully understand what is required to achieve a pass.

There will be two possible outcomes:

- Not professionally competent

On completion of the assessment if there is a shortfall in the evidence requirements, a ‘not pass’ decision will be given.

The PEI will then provide detailed feedback on the areas where the apprentice needs to provide more evidence of competence and/or experience to meet the minimum ‘pass’ requirements. This will enable the apprentice and the employer to develop a CPD plan to enable the apprentice to develop the additional competencies/experience required to be judged professionally competent.

- Professionally competent

On completion of the assessment of the Log Book if sufficient evidence has been presented against all of the criteria laid out in the Standard and all minimum requirements have been met, a ‘pass’ decision will be given.
The PEI will produce a letter stating that the apprentice has met all the requirements for, and has successfully completed the Level 6 Apprenticeship Standard.

6.4 Professional recognition

The Standard states that completion of the apprenticeship will be recognised by the relevant Professional Engineering Institutions.

On completion of the assessment if the apprentice has provided sufficient initial evidence for all 5 competency areas required for professional registration to be fully met, the apprentice will be advised of the process that they must follow in order to progress to formal application for professional registration, if they so wish.

If the apprentice has not provided sufficient evidence, the PEI will provide detailed feedback on the areas in which the apprentice needs to provide more evidence and they will be encouraged to develop a CPD plan to enable the apprentice to develop the additional competencies / experience required to be ready to apply for full professional recognition.

7. End-point Assessment - Final Judgement

The Chair of the panel of appropriately qualified professional engineers, ones holding an IEng or CEng qualification and appointed by the chosen PEI, will make the decision as to whether or not the requirements of the Standard have been achieved and hence whether the apprenticeship has been achieved. The apprentice will need to meet all of the KSB requirements as set out in the standard.

Should the panel judge that the requirements of the Standard have not been met, the apprentice will be eligible to re-apply for an end-point assessment at some future point when deficiencies have been remedied.

8. Independence

The end-point assessment will be carried out by one of the PEIs licenced by the UK Engineering Council. They must also be registered as an assessment organisation on the Skills Funding Agency’s Register of Apprentice Assessment Organisations. The organisation will provide professionally qualified independent assessors holding an IEng or CEng qualification, and will ensure that they have no part in the delivery of the apprenticeship nor any direct connection or relationship to either the employer or the apprentice.
9. End-point Assessment - Summary of rôles and responsibilities

Employer:

- publish and operate a Degree Apprenticeship scheme, mapped to the Standard and underwritten by a PEI;
- support the apprentice to collect the Log Book evidence to go forward to the end-point assessment;
- carry out the Occupational Competence Interview according to the PEI guidelines along with an independent assessor appointed by the assessment organisation.

Apprentice:

- achieve the degree;
- collect the Log Book evidence to go forward to the end-point assessment.

PEI:

- ensure that the HEI academic course is accredited;
- provide adequate mentoring, guidance and support to employers to ensure that apprentices can opt to proceed to professional registration with an appropriate PEI based on satisfactory completion of their apprenticeship;
- develop the criteria for the Occupational Competence Interview and the guidelines as to how the interview should be conducted and provide training to employers where required;
- ensure that the independent assessors hold an IEng or CEng qualification and are trained to carry out end-point assessments;
- provide an appropriately qualified and experienced individual to take part in the occupational competence interview;
- provide the panel of appropriately qualified and experienced assessors to conduct phase two of the end-point assessment - to examine the Log Book submitted by the apprentice to determine whether or not all elements of the KSBs detailed in the Standard have been achieved: whether or not the apprenticeship has been successfully completed.

10. Quality Assurance - internal

Each PEI involved in the assessment of apprentices under this assessment plan will:

- recruit and train assessors who:
  - hold an IEng or CEng qualification;
  - will be trained and experienced in carrying out assessments for professional membership of a PEI against the UK-SPEC;
have recent experience of working in a high-level engineering setting;
- ensure that they have no part in the delivery of the apprenticeship nor any direct
  connection or relationship to either the employer or the apprentice; and
- convene assessment panels of these assessors as requested by employers.

- be expected to put in place quality assurance systems that support fair, reliable and
  consistent assessment across apprenticeships and over time this could include
  contributing to regional and national standardisation meetings with other PEIs.
- develop and make freely available, the assessment criteria for each of the components
  of the end-point assessment and guidance on their application.
- provide training for their assessors on the conduct of the assessment and on the
  consistent application of the criteria by for example carrying out standardisation
  meetings.
- develop policy and procedures around all aspects of the apprenticeship with which they
  are involved, for example how complaints should be handled.

11. Quality Assurance - external

The Engineering Council is the UK regulatory body for the engineering profession. It holds
the national registers for Engineering Technicians (EngTech), Incorporated Engineers (IEng),
and Chartered Engineers (CEng).

In addition, the Engineering Council sets and maintains the internationally recognised
standards of professional competence and ethics that govern the award and retention of
these titles. This ensures that employers, government and wider society - both in the UK
and overseas - can have confidence in the knowledge, experience and commitment of
professionally registered engineers and technicians.

The Engineering Council grants licences to professional engineering institutions (PEIs),
allowing them to assess candidates for inclusion on the national register of professional
engineers and technicians. They can also be licensed to accredit academic programmes and
professional development schemes.

There are currently 35 licensed institutions, which are deemed to have sufficient
experience, procedures and resources to undertake the following tasks:

- Assess the competence and commitment of candidates for registration
- Monitor the continuing professional development of registrants
- Monitor the conduct of registrants

Each PEI undergoes an annual self-assessment process and every five years have to re-apply
for their licence from the Engineering Council. This process ensures that all PEIs maintain
appropriate quality assurance processes.
12. **End-point - Grading**

All of the non-degree course elements of the apprenticeship are evidenced in the Log Book which is examined and judged against the Standard as achieved or not, during the end-point assessment. This is a binary decision: it is either achieved, or not.

The degree course element of the apprenticeship will be subject to the normal grading system used by HEIs: 1st class, 2:1, 2:2, 3 (pass).

For the apprentice to achieve a pass for the whole apprenticeship, the degree course, the occupational competence interview and professional competence assessment must all be passed.

This apprenticeship is designed to be closely aligned to the requirements of the PEIs for membership and professional registration status and as such should be exempt from further grading.

13. **Implementation**

13.1 **Affordability**

Preliminary discussions with assessment organisations indicate a cost for the end-point assessment of between 5% - 10% of the whole cost.

13.2 **Professional Body Recognition**

The Standard states that completion of the apprenticeship will be recognised by the relevant Professional Engineering Institutions.

By closely aligning the KSBs in the Standard to the UK-SPEC and by using assessment panels made up of appropriately professionally qualified chair and members, completion of this apprenticeship should also substantially reduce the time taken for the apprentice to gain the ‘gold star’ status of Chartered Engineer.

13.3 **Volumes**

In the first full-year of operation an estimated 150 apprentices, rising to 750 per year when the programme is mature.
Annex 1  Table of Knowledge, Skills and Behaviours

This is as per the Embedded Electronic Systems Design and Development Engineer Apprenticeship Standard.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>What is Required</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical circuit theory</td>
<td>Understanding of basic electrical theory</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Electronic components</td>
<td>Knowledge of the method of operation of basic semiconductors and passive components including their most common uses</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td></td>
<td>Also the basic formulas used in their application</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Analogue and digital design techniques</td>
<td>Understanding of design of both analogue and digital circuits and the basic design rules for mixed analogue and digital circuit boards</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Structured software</td>
<td>Comprehension of the fundamentals of structured software design</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Company Specifics</td>
<td>Understanding key aspects of the employer’s business and product applications – against a template to be generated by the employer</td>
<td>Log Book</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills</th>
<th>What is Required</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circuit design</td>
<td>Design functional electronic systems and circuits from component level</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Circuit layout</td>
<td>Utilise modern CAD technology to implement circuit design with understanding of considerations for heat dissipation, electrical interference and other industry specific considerations affecting layout</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Structured programming for embedded software</td>
<td>Write and document structured code to comply with industry norms and to allow others to understand and subsequently maintain/modify the code</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Mathematical modelling</td>
<td>Utilise modelling techniques for circuit design, embedded software development and thermal management</td>
<td>Degree / PEI</td>
</tr>
<tr>
<td>Design for purpose</td>
<td>Ability to demonstrate an understanding of the principles and practice of design for market, design for manufacturability, design for testability and design for maintainability</td>
<td>Degree / Log Book</td>
</tr>
<tr>
<td>Testing methodology</td>
<td>Ability to develop a test plan for a product that they have developed</td>
<td>Degree / Log Book</td>
</tr>
<tr>
<td>Product transition</td>
<td>Ability to explain the process by which a product is</td>
<td>Degree / Log Book</td>
</tr>
<tr>
<td>into production</td>
<td>introduced into production, including what aspects are discussed at what stage and with whom and how development gateways work</td>
<td>Book</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Project Management</td>
<td>Ability to develop a basic project plan including resource planning, time planning, use of contingencies etc.</td>
<td>Degree / Log Book</td>
</tr>
<tr>
<td></td>
<td>Also techniques for predicting pinch points and strategies for timescale recovery</td>
<td>Degree / Log Book</td>
</tr>
<tr>
<td>Compliance</td>
<td>Awareness of international standards and compliance requirements for the products designed by the employer</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Ability to discuss the differences between legislative and non-legislative requirements</td>
<td>Log Book</td>
</tr>
<tr>
<td>Commercial awareness</td>
<td>Ability to demonstrate knowledge of basic business fundamentals including costs, overheads, gross margin, net margin, profit, and cash</td>
<td>Log Book</td>
</tr>
<tr>
<td>Health and Safety</td>
<td>Ability to demonstrate awareness and understanding of basic health and safety principles both in the general workplace and specific to electronic circuit design</td>
<td>Log Book</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behaviours</th>
<th>What is Required</th>
<th>Assessment Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>Self-starter, organised thinker</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Works safely and effectively without close supervision</td>
<td>Log Book</td>
</tr>
<tr>
<td>Communication</td>
<td>Confident in oral, written and electronic methods</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Ability to communicate effectively with all levels of stakeholder</td>
<td>Log Book</td>
</tr>
<tr>
<td>Team ethos and leadership</td>
<td>Exhibits leadership behaviour and qualities</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Demonstrable ability to work as a member of a team</td>
<td>Log Book</td>
</tr>
<tr>
<td>Continuous development</td>
<td>Committed to personal learning and development</td>
<td>Log Book</td>
</tr>
<tr>
<td>Problem solving/practicality</td>
<td>Enjoys problem solving</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Able to demonstrate practical capabilities in their professional role</td>
<td>Log Book</td>
</tr>
<tr>
<td>Responsibility</td>
<td>Accepts responsibility for own work and that of others</td>
<td>Log Book</td>
</tr>
<tr>
<td>Ethics and professional standards</td>
<td>Exercises responsibilities in an ethical manner and respects and complies with company rules and guidelines</td>
<td>Log Book</td>
</tr>
<tr>
<td></td>
<td>Able to commit to beliefs, goals, and standards of</td>
<td>Log Book</td>
</tr>
</tbody>
</table>
NB The initials PEI in the Assessment Methods column stand for: Professional Engineering Institution
Annex 2

Embedded Electronic Systems Design and Development Engineer
Level 6 Degree Apprenticeship Standard

Occupation: Embedded Electronic Systems Design and Development Engineer

The role of the Embedded Electronic Systems Design and Development Engineer is to apply their knowledge of electronics and of embedded software to the design of circuits or devices that provide a useful function, that are capable of being manufactured at a competitive cost, and that are reliable and safe in use. This involves the use of the engineer’s knowledge of electronics and electronic principles, married to an expertise in the end use of the final product. In electronics this end use can cover a wide spectrum. Examples of industrial sectors that rely heavily on Embedded Systems Design and Development Engineers include Aerospace, Automotive, Automation and Instrumentation, Robotics, Telecommunications, Information and Computer Technology, Defence, Energy (including renewables), Transport and Consumer Electronics. The role provides the basis of learning with potential to specialise as a Hardware Engineer, Software engineer or Systems Engineer in these sectors and can extend from design of integrated circuits through to complete systems.

Embedded Electronic Systems Design and Development Engineers will spend their careers in these industries developing the next generations of products such as smartphones, electric vehicles, communications satellites, smart grids and bringing concepts such as smart cities into reality. For others, an initial grounding in design and development will prove an excellent launch pad for a career in applications engineering, product management, marketing or general management.

The Embedded Electronic Systems Design and Development Engineer must be proficient in a wide range of skills, underpinned by academic understanding, to enable them to work across these sub-sectors and specialisms.

Apprentices will complete a Degree that will support the fundamental scientific and mathematical principles that equip them with the understanding required to operate effectively and efficiently at a high level within any of these sectors. This will be supported by vocational training to develop the required competencies specific to particular roles within the chosen sectors.

Requirements:

A competent Embedded Electronic Systems Design and Development Engineer will meet the following requirements:

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>What is required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical circuit theory</td>
<td>Understanding of basic electrical theory</td>
</tr>
<tr>
<td>Electronic components</td>
<td>Knowledge of the method of operation of basic semiconductors and passive components including their most common uses. Also the basic formulas used in their application</td>
</tr>
<tr>
<td>Analogue and digital design techniques</td>
<td>Understanding of design of both analogue and digital circuits and the basic design rules for mixed analogue and digital circuit boards</td>
</tr>
<tr>
<td>Structured software</td>
<td>Comprehension of the fundamentals of structured software design</td>
</tr>
<tr>
<td>Company Specifics</td>
<td>Understanding key aspects of the employer’s business and product applications – against a template to be generated by the employer</td>
</tr>
<tr>
<td>Skills</td>
<td>What is required</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Circuit design</td>
<td>Design functional electronic systems and circuits from component level</td>
</tr>
<tr>
<td>Circuit layout</td>
<td>Utilise modern CAD technology to implement circuit design with understanding of considerations for heat dissipation, electrical interference and other industry specific considerations affecting layout</td>
</tr>
<tr>
<td>Structured programming for embedded software</td>
<td>Write and document structured code to comply with industry norms and to allow others to understand and subsequently maintain/modify the code</td>
</tr>
<tr>
<td>Mathematical modelling</td>
<td>Utilise modelling techniques for circuit design, embedded software development and thermal management</td>
</tr>
<tr>
<td>Design for purpose</td>
<td>Ability to demonstrate an understanding of the principles and practice of design for market, design for manufacturability, design for testability and design for maintainability</td>
</tr>
<tr>
<td>Testing methodology</td>
<td>Ability to develop a test plan for a product that they have developed</td>
</tr>
<tr>
<td>Product transition into production</td>
<td>Ability to explain the process by which a product is introduced into production, including what aspects are discussed at what stage and with whom and how development gateways work</td>
</tr>
<tr>
<td>Project Management</td>
<td>Ability to develop a basic project plan including resource planning, time planning, use of contingencies etc. Also techniques for predicting pinch points and strategies for timescale recovery</td>
</tr>
<tr>
<td>Compliance</td>
<td>Awareness of international standards and compliance requirements for the products designed by the employer. Ability to discuss the differences between legislative and non-legislative requirements</td>
</tr>
<tr>
<td>Commercial awareness</td>
<td>Ability to demonstrate knowledge of basic business fundamentals including costs, overheads, gross margin, net margin, profit, and cash</td>
</tr>
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<td>Accepts responsibility for own work and that of others</td>
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<td>Ethics and professional standards</td>
<td>Exercises responsibilities in an ethical manner and respects and complies with company rules and guidelines. Able to commit to beliefs, goals, and standards of their employer and the wider industry and its professional standards</td>
</tr>
</tbody>
</table>
Duration:
The duration of this apprenticeship is unlikely to be less than 36 months.

Entry Requirements:
Individual employers will set their own entry requirements in terms of prior academic qualifications and experience. Typically candidates will have attained A-Level standard or equivalent, in Maths and at least one further STEM based subject such as Physics, ICT, Computing or Electronics and will have English Language at GCSE (grade C or above).

Level:
The Apprenticeship Standard is at Level 6.

An Honours Degree in Electronics or Electrical & Electronic Engineering which has been accredited by one of the Professional Engineering Institutions licensed by the UK Engineering Council.

Apprentices without a Level 2 English and maths must complete this prior to taking the end-point assessment.

Professional Registration:
Completion of the Apprenticeship will be recognised by the relevant Professional Engineering Institutions.

Review:
The standard will be initially reviewed after three years to ensure it reflects employer demand for changes in the syllabus.
Incorporated Engineers are able to demonstrate: maintenance, construction and operation.

Incorporated Engineers maintain and manage applications of current and developing technologies, and may undertake engineering developments, maintenance, construction and operation.

The UK Standard for Professional Engineering Competence (UK-SPEC) describes the value of becoming registered as an Incorporated Engineer. It describes the requirements that have to be met by you as an apprentice in order to gain this qualification, and gives examples of ways of doing this. You should download the SPEC for reference, and get more information about the benefits of being an approved Incorporated Engineer.

The UK standard for Professional Engineering Competence (UK-SPEC) describes the value of becoming registered as an Incorporated Engineer (IEng). It describes the requirements that have to be met by you as an apprentice in order to gain this qualification, and gives examples of ways of doing this.

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<table>
<thead>
<tr>
<th>Assessment Name</th>
<th>Assessment Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insert Name</td>
<td>Insert Number</td>
</tr>
</tbody>
</table>

Aerospace and Aviation Trailblazer Standard

This is an example of a log book associated with a different Apprenticeship, purely for illustrative purposes. This is not the log book that will be used for this Apprenticeship.

Insert Name

Insert Date

Date of Assessment by Institution

Assessor Signature

Assessor Name

Apprentice Name

Apprentice Employee Number if applicable

Incorporated Engineer Performance Indicators Recording Form

Aerospace and Aviation Trailblazer Standard

This is an example of a log book associated with a different Apprenticeship, purely for illustrative purposes. This is not the log book that will be used for this Apprenticeship.

Annex 3  

ST0131/001
### A1 Maintain and extend a sound theoretical approach to the application of technology and engage in formal learning. Earn new and emerging theories and techniques in the workplace.

**Comments**
- Please indicate your opinion of the candidate's performance in each of the sections.
- Supporter/Endorser: Please sign each section to confirm that the evidence is a fair and accurate record.

**Endorsement**
- Please record your evidence in the boxes below against the criteria highlighted. The reviewers will be looking for evidence that you have the know-how to do the job, and were able to go beyond the immediate requirements and use your initiative and experience to solve a problem or improve a process.

**Supporter/Endorser**
- Please record your evidence in the boxes below against the criteria highlighted. The reviewers will be looking for evidence that you have the know-how to do the job, and were able to go beyond the immediate requirements and use your initiative and experience to solve a problem or improve a process.

**Exhaustive & Commitment**
- You are not required to give multiple examples to demonstrate competence. You must demonstrate the required competence and commitment for IEng registration. You are not required to give multiple examples to demonstrate competence. Moreover, you are not required to give multiple examples to demonstrate competence.

### 4 Use a combination of general and specialist engineering knowledge and understanding to apply existing knowledge and emerging technologies.

**Commitment and Commitment**
- Commitment to professional engineering values.
- Effective interpersonal skills in communicating technical matters.
- Responsibility for project and financial planning and management together with some responsibility for leading and developing other professional staff.
- Successful application of their knowledge to deliver engineering projects or services using established technologies and methods.
<table>
<thead>
<tr>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribute to the evaluation and development of continuous improvement and systems.</td>
</tr>
<tr>
<td>Contribute to continuous improvement and systems. Use market intelligence and knowledge of technological developments to improve the effectiveness of engineering products and services.</td>
</tr>
<tr>
<td>Evidence from best practice to improve efficiency. Apply root cause analysis. Involvement with cross-disciplinary working. Conduct statistically sound appraisal of data. Use evidence from best practice to improve effectiveness. Use market intelligence and knowledge of technological developments to promote and improve the effectiveness of engineering products and services.</td>
</tr>
<tr>
<td>This could include an ability to: contribute to continuous improvement.</td>
</tr>
<tr>
<td>Use a sound evidence-based approach.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supporter/Endorser Signature and Comments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broader and deepen own knowledge base.</td>
</tr>
<tr>
<td>Strive to extend own technological capability.</td>
</tr>
<tr>
<td>Identify the limits of own personal knowledge and skills.</td>
</tr>
<tr>
<td>Strive to extend own technological capability.</td>
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<tr>
<td>Strive to extend own technological capability.</td>
</tr>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>B Apply appropriate theoretical and practical methods to design, develop, manufacture, construct, commission, operate, maintain, decommission and re-cycle engineering processes, systems, and products.</td>
</tr>
<tr>
<td>B1 Identify, review and select techniques, procedures, and methods to undertake engineering tasks. This could include:</td>
</tr>
<tr>
<td>• Contribute to the specification and procurement of new engineering products and systems.</td>
</tr>
<tr>
<td>Evidence</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Evidence</td>
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<tr>
<td>Evidence</td>
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<tr>
<td>Evidence</td>
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<tr>
<td>Evidence</td>
</tr>
<tr>
<td>Evidence</td>
</tr>
</tbody>
</table>

Supporter/Endorser Signature and Comments

B2 Contribute to the design and development of engineering solutions. This could include an ability to:

- Contribute to the identification and specification of design and development requirements for engineering products, processes, systems, and services.
- Identify operation risks and evaluate likely operational risks and evaluate opportunities and environmental impact.
- Establish an action plan to implement the results of the review.
- Use evidence from best practice to enhance engineering practices, products, processes, systems, and services, using evidence from best practice.
<table>
<thead>
<tr>
<th>Evidence</th>
<th>Implementation and take corrective action.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence</td>
<td>Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Implement design solutions, taking account of critical constraints, including due concern for safety and sustainability.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Secure the resources required for the implementation.</td>
</tr>
<tr>
<td>Comments</td>
<td>This could include an ability to: contribute to their evaluation.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Collect and analyse results.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Carry out necessary tests.</td>
</tr>
</tbody>
</table>

**B3 Implement design solutions, maintaining performance.**

Contribute to determining critical success factors.

Follow the design process through into product manufacture, operation and maintenance processes.

Contribute to reports on the evaluation of the effectiveness of the design, including systems etc. Contribute to reports on the evaluation of the effectiveness of the design, including systems etc. Contribute to reports on the evaluation of the effectiveness of the design, including systems etc. Contribute to reports on the evaluation of the effectiveness of the design, including systems etc.
<table>
<thead>
<tr>
<th>Evidence</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify factors affecting the project implementation</td>
<td>• Prepare and agree implementation plans</td>
</tr>
<tr>
<td>• Carry out holistic and systematic risk identification, assessment and management</td>
<td>• Evaluate project planning activities, produce and agree plans</td>
</tr>
<tr>
<td>• Contribute to project planning activities</td>
<td>• Contribute to project planning activities, produce and agree plans</td>
</tr>
</tbody>
</table>

**Evidence**

**Supporter/Endorser Signature and Comments**

**Contribute to Recommendations for Improvement and actively learn from feedback on results.**

**Contribute to Recommendations for Improvement and actively learn from feedback on results.**

**Contribute to Recommendations for Improvement and actively learn from feedback on results.**

**Contribute to Recommendations for Improvement and actively learn from feedback on results.**
<table>
<thead>
<tr>
<th>C2</th>
<th>Manage tasks, people and resources to plan and budget.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evidence</strong></td>
<td>Manage tasks within identified financial, commercial and regulatory constraints.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Operate appropriate management systems.</td>
</tr>
<tr>
<td><strong>Supporter/Endorser Signature and Comments</strong></td>
<td>Operate appropriate management systems.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>This could include an ability to:</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Contribute to the management of project funding, payments and recovery.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Satisfy legal and statutory obligations.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Manage the balance between quality, cost and time.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Operate appropriate management systems.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Work to the agreed quality standards.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td>Manage/contribute to project operations.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>C3</th>
<th>Manage teams and develop staff to meet changing technical and managerial needs.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This could include an ability to:</td>
</tr>
<tr>
<td></td>
<td>• Agree objectives and work plans with teams and individuals</td>
</tr>
<tr>
<td></td>
<td>• Identify team and individual needs,</td>
</tr>
<tr>
<td></td>
<td>• Manage work teams, coordinating project activities</td>
</tr>
<tr>
<td></td>
<td>• Evaluate performance and recommend improvements</td>
</tr>
<tr>
<td></td>
<td>• Collective action, programme and budget, and take collective action</td>
</tr>
<tr>
<td></td>
<td>• Identify variations from quality standards,</td>
</tr>
<tr>
<td></td>
<td>• Manage work teams, coordinating project activities</td>
</tr>
<tr>
<td></td>
<td>• Evidence</td>
</tr>
<tr>
<td></td>
<td>Evidence</td>
</tr>
<tr>
<td></td>
<td>Evidence</td>
</tr>
<tr>
<td></td>
<td>Evidence</td>
</tr>
</tbody>
</table>
Evidence

- Reinforce team commitment to professional standards

Evidence

- Supporter/Endorser Signature and Comments

Evidence

- Ensure the application of quality management principles by team members and colleagues

Evidence

- Evaluate changes to meet quality objectives. Improve delivery, identify, implement and maintain quality management principles by team members and colleagues. Contribute to quality audits.

Evidence

- Promote quality. Manage/Contribute to best practice methods of continuous improvement. E.g. ISO 9000, EFQM. Develop and contribute to best practice methods of continuous improvement.

Evidence

- Manage continuous quality improvement. This could include an ability to:

  - Perform, assess, and provide feedback.

  - Enhance and support team and individual development.

  - Reinforce team commitment to professional standards.

  - Monitor, maintain, and improve delivery. Identify, implement and maintain quality management principles by team members and colleagues.

  - Carry out/Contribute to quality audits. Monitor, maintain and improve delivery.

  - Identify, implement and evaluate changes to meet quality objectives.

  - Supporter/Endorser Signature and Comments

  - Ensure the application of quality management principles by team members and colleagues

  - Evaluate changes to meet quality objectives. Improve delivery, identify, implement and maintain quality management principles by team members and colleagues. Contribute to quality audits.

  - Promote quality. Manage/Contribute to best practice methods of continuous improvement. E.g. ISO 9000, EFQM. Develop and contribute to best practice methods of continuous improvement.

  - Manage continuous quality improvement. This could include an ability to:

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    - Enhance and support team and individual development.

    - Reinforce team commitment to professional standards.
<table>
<thead>
<tr>
<th>Evidence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare communications, documents</td>
<td></td>
</tr>
<tr>
<td>Participate in meetings and discussions</td>
<td></td>
</tr>
<tr>
<td>Engage or interact with professional networks, including documents, correspondence, in a variety of formats, reports, letters, emails, drawings, specifications, and working papers (e.g., meeting minutes)</td>
<td></td>
</tr>
<tr>
<td>This could include an ability to:</td>
<td></td>
</tr>
<tr>
<td>Communicate in English with others at all levels</td>
<td></td>
</tr>
<tr>
<td>D1 Demonstrate effective interpersonal skills</td>
<td></td>
</tr>
<tr>
<td>D2 Demonstrate effective communication</td>
<td></td>
</tr>
<tr>
<td>Supporter/Endorser signature and recommendations for improvement</td>
<td></td>
</tr>
<tr>
<td>Evaluate projects and make quality standards</td>
<td></td>
</tr>
<tr>
<td>Manage operations to maintain</td>
<td></td>
</tr>
</tbody>
</table>
| Evidence | Present and discuss proposals. This could include an ability to:

| Evidence | Presentations, records of discussions, and their outcomes.

| Evidence | Prepare and deliver appropriate presentations.

| Evidence | Manage debates with audiences.

| Evidence | Feed the results back to improve the proposals.

| Evidence | Contribute to the awareness of risk.

| Evidence | Exchange information and provide advice to technical and non-technical colleagues.

| Comments | Supporter/Endorser: Signature and date.

<p>| Comments |</p>
<table>
<thead>
<tr>
<th>Evidence</th>
<th>D3 Demonstrate personal and social skills.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This could include an ability to:</td>
</tr>
<tr>
<td></td>
<td>Records of meetings. Evidence from colleagues of your personal and social skills. Contribute to productive working relationships. Apply diversity and anti-discrimination legislation.</td>
</tr>
<tr>
<td></td>
<td>Know and manage own emotions, strength and weaknesses.</td>
</tr>
<tr>
<td></td>
<td>Be aware of the needs and concerns of others. Especially where related to diversity and equality. Be confident and flexible in dealing with new and changing interpersonal situations.</td>
</tr>
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<tr>
<td></td>
<td>Identify, agree and work towards collective goals.</td>
</tr>
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<td></td>
<td>Be confident and flexible in dealing with new and changing interpersonal situations.</td>
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<tr>
<td></td>
<td>Know and manage own emotions, strength and weaknesses.</td>
</tr>
<tr>
<td></td>
<td>Collect evidence of diversity and equality of others, especially where related to diversity and equality. Be confident and flexible in dealing with new and changing interpersonal situations.</td>
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<tr>
<td></td>
<td>Know and manage own emotions, strength and weaknesses.</td>
</tr>
<tr>
<td></td>
<td>Create, maintain and enhance productive working relationships, and</td>
</tr>
<tr>
<td></td>
<td>Identify, agree and work towards collective goals.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
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<td>Comments</td>
</tr>
<tr>
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<td><strong>E1</strong> Comply with relevant codes of conduct.</td>
<td>This could include an ability to:</td>
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<tr>
<td><strong>E2</strong> Manage and apply systems of work within all relevant legislation and regulatory frameworks, including social and employment legislation.</td>
<td>Contribute to the affairs of your institution, work with a variety of conditions of contract.</td>
</tr>
<tr>
<td><strong>E3</strong> Contribute to the affairs of your institution, work with a variety of conditions of contract.</td>
<td>Comply with the rules of professional conduct of the Royal Aeronautical Society.</td>
</tr>
<tr>
<td><strong>E4</strong> Demonstrate a personal commitment to professional standards, recognizing obligations to the profession and the society.</td>
<td>Comply with the rules of professional conduct of the Royal Aeronautical Society.</td>
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Supporter/Endorser Signature and Comments
| Evidence | 
|---|---|---|---|---|---
| **Evidence** | **Supporter/Endorse Signature and Comments** | **Evidence** | **Supporter/Endorse Signature and Comments** | **Evidence** | **Supporter/Endorse Signature and Comments** |
| • Apply a sound knowledge of health and safety legislation | • Manage, evaluate and improve these systems | • Manage systems that satisfy health, safety and welfare requirements | • Maintain suitable health and safety management systems and culture | • Develop and implement requirements for own obligations for health, safety and welfare | • Identify and take responsibility for own obligations for health, safety and welfare |
| • Develop and implement appropriate hazard identification and risk management systems and culture | • Manage, evaluate and improve these systems | • Manage systems that satisfy health, safety and welfare requirements | • Maintain suitable health and safety management systems and culture | • Develop and implement requirements for own obligations for health, safety and welfare | • Identify and take responsibility for own obligations for health, safety and welfare |
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This could include an ability to:
- Carry out safety audits, identify and minimise hazards, assess and control risks, deliver health and company safety policies.
- Manage, evaluate and improve these systems.
- Manage, evaluate and improve these systems.
- Maintain suitable health and safety management systems and culture.
- Develop and implement requirements for own obligations for health, safety and welfare.
- Identify and take responsibility for own obligations for health, safety and welfare.
- Develop and implement appropriate hazard identification and risk management systems and culture.
### Evidence

- Undertake and encourage stakeholder involvement in sustainable development.
- Understand and encourage stakeholder involvement of objectives, environmental and community, and meet and enhance the quality of the outcomes simultaneously environmental, social and economic account of the need to progress.
- Operate and act responsibly, taking responsibility, and accountability to social, economic and environmental development.
- Adopt sustainable practices, contribute to social, economic and environmental development.
- Undertake engineering activities in a way that contributes to sustainable development.
- Carrying out/Contribute to environmental impact assessments, Carry out/Contribute to environmental impact assessments, Carry out/Contribute to environmental impact assessments.
- Manage best practice environmental management systems, e.g. ISO 14001.
- Manage best practice risk management systems, e.g. ISO 31000.
- Carry out/contribute to environmental impact assessments.
- Provide products and services which maintain and enhance the quality of the environment and community, and meet financial objectives.
- Evidence

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**Note:** This could include an ability to:

- Undertake environmental activities in a way that contributes to sustainable development.
<table>
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<tr>
<th>Evidence</th>
<th>Maintain evidence of competence</th>
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<tbody>
<tr>
<td>Evidence</td>
<td>Activities: carry out planned (and unplanned) CPD activities</td>
</tr>
<tr>
<td>Evidence</td>
<td>Plan how to meet personal and organizational objectives</td>
</tr>
<tr>
<td>Evidence</td>
<td>Undertake reviews of own development needs</td>
</tr>
<tr>
<td>Evidence</td>
<td>Undertake reviews of own development needs</td>
</tr>
</tbody>
</table>

- Evidence of continued professional development (CPD) necessary to maintain and enhance competence in own area of practice including:
  - Keep up to date with national and international engineering issues, evidence of your development through on-the-job learning, private study, in-house courses, external courses and conferences.
  - Evidence of CPD activity and record this evidence in any format or medium, under the terms of the Open Government Licence.
| Evidence | Give an example of where you have applied/updated ethical principles as defined by your organisation or company, which may be in its company or brand values. |
| Evidence | Give an example of where you have applied/upheld ethical principles as defined by your organisation or company, which may be in its company or brand values. |
| Evidence | Give an example of where you have applied/upheld ethical principles as defined by your organisation or company, which may be in its company or brand values. |

Give an example of where you have applied/upheld ethical principles as defined by your organisation or company, which may be in its company or brand values.

Please refer to the Statement of Ethical Principles on page 33 of UK SPEC:

http://www.engc.org.uk/professional-qualifications/standards/uk-spec/docs/2015/statement-ethical-principles.pdf

Ed Exercise responsibilities in an ethical manner.

Supporter/Endorser Signature and Comments

| Evidence | Evaluate CPD outcomes against the action plans. |
| Evidence | Assist others with their own CPD. |
Education and Knowledge and understanding are important components of professional competence. Formal education is the usual, though not the only, way of demonstrating the necessary knowledge and understanding. Applicants who do not have exemplifying qualifications may demonstrate the required knowledge and understanding in other ways, but must clearly demonstrate they have achieved the same level of knowledge and understanding as those with exemplifying qualifications.

Ways to demonstrate this include:

- Taking further qualifications, in whole or in part, as specified by the institution to which they are applying
- Completing a technical report, based on their experience, and demonstrating their knowledge and understanding of engineering principles
- Completing appropriate work-based or experiential learning
- Writing a technical report, based on their experience, and demonstrating their knowledge and understanding of engineering principles
- Taking appropriate courses or programmes, which have been approved for the purpose by a licensed professional engineering institution, plus appropriate further learning to degree level

The Engineering Council provides searchable databases of accredited programmes. Please check the Engineering Council website:

www.engc.org.uk/courses

Supporter/Endorser Signature and Comments
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<tr>
<th>Apprentice has met the EngTech criteria</th>
<th>Tick as appropriate:</th>
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<tr>
<td>Apprentice requires further development</td>
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<tr>
<th>Assessor name</th>
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UK degree apprenticeships a year in review – A focus on the digital & technology solutions professional degree apprenticeship at Manchester Metropolitan University

Goodyer, JE

2016-11-01