# Degree Apprenticeship Level 6 (Wales)

# Advanced Manufacturing and Engineering (AM&M) sector in Wales

## Contents

Sections in red have questions that need to be answered in this consultation and your answers will be very helpful in developing the final structure and content of the Degree Apprenticeship.

# Background information

**SEMTA**

The Apprenticeship sector for occupations in science, engineering and manufacturing technologies.

| | |
|---|---|
| Issue Number: 1 | This framework includes: |
| Framework ID: | Level 6 |
| | |
| Date this framework is to be reviewed by: 01/03/2019 | This framework is for use in: Wales |

**Short description**

The Degree Apprenticeship framework for Advanced Manufacturing and Engineering at Level 6 has been designed by employers to provide the manufacturing and engineering sector in Wales with high grade engineers, through work-based learning. Degree Apprentices will develop higher level practical skills, combined with an honours degree, which contribute to the necessary skills, knowledge, competence and commitment required to apply for accreditation at Incorporated Engineer status.

Designed to have a flexible delivery model with employer-based entry and exit points, it meets the needs of today's industry in Wales.

# Contact information

## Proposer of this framework

This scheme is based on several discussions with the Welsh government, feedback from employers and providers in Wales and a research document produced by Miller Research on the subject of developing a Degree Apprenticeship at Level 6 for the advanced engineering and manufacturing sector in Wales.

Following a positive response from the research, Semta has held physical and online employer and stakeholder consultations throughout Wales and used the feedback to develop this Degree Apprenticeship. Participants included Amcanu, CP Engineering, Cytec/Solvay, EBS Automation, Gestamp, Hornbill, Kellogs, Nidec Control Techniques, Probe, Schaeffler, Sumitomo Electric Wiring Systems Europe Ltd. TATA Steel, Tidal Lagoon Power, Toyota, TWI, Valero, Wall Colmonoy, along with providers representing other companies in their area such as Cardiff University, Coleg Sir Gar, Glyndwr University, Gower College Swansea, Swansea University, University Wales Trinity St David, HEFCW, Industry Wales and Welsh Automotive Forum.

## Developer of the Master Craftsperson recognition scheme

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# Purpose of the Degree Apprenticeship

Semta, in association with the Welsh Government, was asked to research into the feasibility of developing a Degree Apprenticeship within the Advanced Manufacturing and Engineering (AME) sector in Wales, focussing on the need of industry for meeting skills requirements at the higher levels, the potential demand for the scheme and the framework content or structure.

Data was gathered from companies operating in the AME sector in Wales via a survey, interviews and a series of workshops throughout the country, promoted by Semta through their various communication networks.

Using these results, Semta has developed a Degree Apprenticeship framework for use within Wales. Primarily, the framework is aimed at the engineering and manufacturing sectors, although there is an option to roll it out to other sectors, such as Civil/Construction and Chemical, if it is successful.

This Degree Apprenticeship for Advanced Manufacturing and Engineering at Level 6 has been designed by employers to provide the manufacturing and engineering sector in Wales with high grade engineers through work-based learning. Degree Apprentices will develop higher level practical skills, combined with an honours degree, which contribute to the necessary skills, knowledge, competence and commitment required to apply for accreditation at Incorporated Engineer status. These apprentices will be encouraged to become Associate Members of IMechE, IET or RAeS when they start their apprenticeship, in order to gain help and support from the Professional Institutions during their journey to registration.

### Profile of the Advanced Manufacturing and Engineering sector in Wales

The manufacturing sector in Wales employs approximately 133,000 people across nearly 6,000 establishments, with an estimated 80,000 engineers, scientists and technologists working across the manufacturing sectors. Of these technical roles, just over a quarter (22,600) are employed in higher-level technical roles made up of 4,800 technicians, 7,400 professional engineers and 10,400 engineering managers.

The main sub-occupations within the higher-level technical occupations are:
- Technicians - engineering technicians, draughtspersons, laboratory technicians, electrical and electronics technicians and quality assurance technicians
- Professionals – mechanical engineers, electrical engineers, design and development engineers, production and process engineers and planning and quality control engineers
- Managers – production, works and maintenance managers, research and development managers and quality assurance managers

Just over half of this workforce is qualified to NVQ level 4 or equivalent and above which leaves just under half with qualifications below Level 4 or the equivalent.

The workforce is predominantly white, male, with around 86% aged in the 25 – 60 range, which means that the workforce is aging.

There are around 400 vacancies per year with employers reporting around 100 of these vacancies being hard to fill as one third of applicants did not have the required technical and practical skills.

Around 4,400 employees have skills gaps in higher-level occupations in the manufacturing sector made up of 1,280 technicians, 970 professionals and 2,150 managers.
*Welsh speaking apprentices?*

## Challenges facing the Advanced Manufacturing and Engineering sector

There is a demand from employers to increase the number of employees with higher level skills in order to increase productivity and for them to remain competitive

The workforce is aging and 3,400 higher-level technical workers (690 per annum) are required over the period 2012-2016 to replace those retiring in Wales

Despite the recession, manufacturing employers still have a substantial need for new recruits. In 2009, 3% of manufacturing establishments in Wales had vacancies for higher-level occupations. Of those manufacturing sites with vacancies for higher-level occupations:

- 16% had vacancies for technicians
- 7% had vacancies for professionals
- 12% had vacancies for managers

There are 400 higher-level vacancies, made up of 70 technicians, 190 professionals and 140 managers

Employers experiencing difficulties in filling higher-level occupations report that this impacts on their business by increasing the workload for other staff, increases operating costs, difficulties introducing new working practices and in meeting quality standards, delays in developing new products and services and loss of business orders to competitors

The incidence of higher-level occupational skills gaps in the manufacturing sector increases by size of establishment, ranging from 4% of micro-sized establishments, 13% of SMEs and 47% of large establishments

The importance of higher-level technical roles to manufacturing is growing. In 2001, higher-level technical roles made up 13% of total manufacturing employment. By 2010 this figure was 17%. This trend is expected to continue, with jobs in medium to low-level skilled craft and operator occupations projected to decrease their share of total employment during 2012 to 2016. (LMI to be updated to 2018/2019)

For those establishments with higher-level technical skills gaps, it is expected that staff would mainly need to acquire new skills or knowledge in the next 12 months as a result of introducing new working practices, developing new products or services, and the introduction of new technologies or equipment. There is a growing blurring of the boundaries between traditional engineering and manufacturing, and newer digital occupations such as software programming, data analysis and interface development, and higher-level courses should include some form of this content. Engineers at the higher level need to have some form of programming knowledge to be able to embed the knowledge they have of systems or functions (such as robotics) into applications that enable data to be analysed (such as the collection and use of data collected through sensors).

Gaps also exist in additional areas such as leadership and management training, particularly as degree level apprentices are those with future leadership potential.

Employers are not in favour of many pathways at this level. Only three are included:

- Mechanical
- Electrical/Electronics
- Electo-mechanical

which means the framework is less complicated and allows individuals to choose their own route through the framework, whist following the given pathways.

Companies increasingly need employees who can combine practical skills and knowledge, so this new degree level apprenticeship has significantly more practical training content that is currently available at Level 6 in full or part-time degrees by offering combined qualifications. These also meet the UK Spec requirements for Incorporated Engineer status.

**Aims and objectives of this framework (Wales)**

The aim of this Level 6 framework is to provide the manufacturing and engineering sector in Wales with high grade and high level technicians and engineers who possess practical skills, combined with a higher education qualification to meet the skills needs of employers and to help them to improve productivity and remain competitive.

Additional benefits include:
- helping to improve recruitment and retention rates within the industry by offering appropriate career progression into higher level jobs and training, and working towards Incorporated Engineer* status
- providing a clear and comprehensive framework with flexibility (entry and exit points and delivery model – day release or block release)
- providing a clear progression route from Level 2 to Level 7, so that career progression routes are visible

* The IEng (Incorporated Engineer) status can be sought after the completion of the EngTech or higher formal qualification. Candidates must demonstrate technical and commercial management skills, commitment to professional standards and obligations, the use of technical/engineering knowledge to apply technology to their work and the application of theoretical and practical methods to a process, system, service or product.

http://www.theiet.org/membership/profreg/ieng/requirements/

http://www.imeche.org/membership-registration/become-a-member

# Entry requirements

The scheme will lead to recognition at Level 6.

To qualify for the Level 6 scheme, participants will be required to have:

- previously completed an engineering related apprenticeship (at Level 4) or
- achieved a variety of qualifications such as STEM A Levels (eg Maths, Science, Design Technology), Certificate/ Diploma in Engineering, Apprenticeship in Engineering or
- if they do not have formal qualifications they will be required to provide evidence that shows they are currently working at a Level 4 standard (perhaps through a portfolio of experience) with the potential to achieve at Level 6.

In addition to Level 4 qualifications or experience, the participants have to undergo an employer interview process prior to acceptance onto the Degree Apprenticeship.

Please note: Applicants for this apprenticeship framework are likely to be 18+ years.

### Initial Assessment

It is highly likely that applicants will be asked to undertake a variety of tests which will include English, Maths, spatial awareness and problem solving, supported by an interview. These are not a meant as a barrier to entry but more to gauge the ability of the applicant to achieve the programme and to tailor the individual learning plan to meet their needs and those of the employer.

### Rules to avoid the need to repeat qualifications

Processes exist to make sure that applicants with relevant prior knowledge, qualifications and/or experience are not disadvantaged by having to repeat learning. Training providers, awarding organisations, colleges and universities will be able to advise on the current rules for accrediting prior learning and recognising prior experience. Refer to the on and off-the-job training sections for more detail of prior learning and experience. There are no relaxations or proxies for any qualifications specified in a framework in SASW, however providers are encouraged to identify additional on-the-job training programmes that customise the learning to the new workplace.

### Essential Skills Qualifications

The new set of Essential Skills Qualifications (ESQ): Essential Communication Skills, Essential Application of Number Skills and Essential Digital Literacy Skills must be achieved at Level 2 for this recognition scheme.

Recognised proxies for the new ESQ qualifications are accepted - these are listed in the front of this framework document. Essential Skills Wales or ESQ qualifications achieved in the context of the Welsh Baccalaureate Qualification (WBQ) can be accepted, provided the specific certification of the title(s) and level(s) of those ESW/ESQ qualifications is provided. The WBQ certificate itself does not provide this specific evidence.

### Combined Competence and Knowledge qualifications

These are new and developed specifically for this framework, so apprentices will not have already achieved any of those listed.

**Wider Key Skills**

Wider Key Skills qualifications are no longer required for this framework.

**Prior experience in the sector**

Applicants that are already working in the sector or who have recently worked in the sector, can apply to have their experience formally recognised by an awarding organisation and this will count towards the qualification(s) in this framework.

# Content of the Degree Apprenticeship

The duration depends on the qualification and unit options selected and is typically 3-4 years.

To meet industry need for a higher level of practical-based degree content, new combined qualifications have been developed specifically for this apprenticeship at Level 6. Employers, universities, and professional bodies have come together to co-design a fully-integrated degree course specifically for apprentices, which delivers and tests both academic learning and on-the-job training.

The combined qualification includes practical basic engineering skills, as well as specific high level employed-based skills. As well as technical content, courses also include leadership and management, communication skills, critical thinking, risk management, project management, and sales and marketing skills.

Apprentices will complete an assessment at the end of the programme, which tests both academic learning and occupational competence developed through on-the-job training. The end of degree (or module) projects are based on a live (where possible) work related project, and assessed at the employer's premises.

Degrees earned via this route will be awarded by universities and will be of an equivalent standard to degrees taken via the full-time undergraduate route

Each qualification has flexible entry and exit points to accommodate work commitments, project activity and progression timelines.

The following table lists the subject areas covered in this Degree Apprenticeship (Consultation - **please indicate if others are required**)

| Instrumentation | Mechanical | Control & motion |
|---|---|---|
| Automation Control | Software | Power Electronics |
| Electrical | PLC Control | Electrical Engineering |
| Logic control | Machine Design | Robotics |

There are three pathways:

- Mechanical
- Electrical/Electronics
- Electo-mechanical

Each pathway includes the UK Standard for Professional Engineering Competence (Incorporated Engineer) and a range of combined competency/knowledge qualifications.

Consultation - **Please indicate if only one generic pathway is preferred and explain why**

## Level 6, Pathway 1: Mechanical

**Description of this pathway**

Mechanical engineers produce specifications for, design, develop, manufacture and install new or modified mechanical components or systems. They need to be technically minded, able to demonstrate numerical and scientific ability and have problem solving skills.

**Entry requirements for this pathway in addition to the framework entry requirements**

There are no additional requirements other than the general entry conditions

Typical job titles could be:

- Manufacturing Engineer
- Controls Engineer (Mechanical Testing)
- Production Engineer
- Mechanical Systems Engineer
- Quality Manager (Thermal development)
- Environmental Test Engineer (Defence)

**(Consultation - Please add/amend as relevant to industry needs in Wales and add a job description)**

## Qualifications

**Competence qualifications available to this pathway**

| C1 - UK Standard for Professional Engineering Competence (Incorporated Engineer) | | | | | |
|------|---------|----------------------|--------------|-------------------------|---------------------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| C1a | N/A | Institute of Mechanical Engineers (IMechE) | N/A | Various | N/A |
| C1b | N/A | Institute of Engineering and Technology (IET) | N/A | Various | N/A |
| C1c | N/A | Royal Aeronautical Society (RAeS) | N/A | Various | N/A |

**Combined qualifications available to this pathway**

| Example: B1 - BEng (Hons) Mechanical Engineering | | | | | |
|------|---------|----------------------|--------------|-------------------------|---------------------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| B1a | xx | Name of university/college | HE360 | N/A | N/A |

# Level 6, Pathway 2: Electrical/Electronics

**Description of this pathway**

Electrical engineers design, develop, test, and supervise the manufacturing of electrical equipment, such as electric motors, radar and navigation systems, communications systems, or power generation equipment. Electrical engineers also design the electrical systems of automobiles and aircraft.

Electronics engineers design and develop electronic equipment, such as broadcast and communications systems, from portable music players to global positioning systems (GPS). Many also work in areas closely related to computer hardware.

**Entry requirements for this pathway in addition to the framework entry requirements**

There are no additional requirements other than the general entry conditions


Typical job titles could be:

- Electronics Production Engineer
- Electrical/Electronics Engineer (Aerospace Computer Systems)
- Electrical/Electronics Engineer (Wind Power)
- Motorsport Electrical /Electronics Engineer
- Electronics Development Engineer
- Analogue / Rf Design Engineer
- Acoustic Design Engineer


**(Consultation - Please add/amend as relevant to industry needs in Wales and add a job description)**

# Qualifications
**Competence qualifications available to this pathway**

| C1 - UK Standard for Professional Engineering Competence (Incorporated Engineer) | | | | | |
|------|---------|----------------------|--------|---------|--------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| C1a | N/A | Institute of Mechanical Engineers (IMechE) | N/A | Various | N/A |
| C1b | N/A | Institute of Engineering and Technology (IET) | N/A | Various | N/A |
| C1c | N/A | Royal Aeronautical Society (RAeS) | N/A | Various | N/A |


**Combined qualifications available to this pathway**

| Example: B1 - BEng (Hons) Electronics Engineering | | | | | |
|------|---------|----------------------|--------|---------|--------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| B1a | xx | Name of university/college | HE360 | N/A | N/A |

## Level 6, Pathway 3: Electro-Mechanical

**Description of this pathway**

Electromechanical engineers bring the principles of electrical and mechanical engineering to the workplace. All kinds of products, from space satellites to computer monitors, are both electrical and mechanical in nature; electromechanical engineers conceptualize and build machines that use both technologies.

**Entry requirements for this pathway in addition to the framework entry requirements**

There are no additional requirements other than the general entry conditions

Typical job titles could be:

- Manufacturing Engineer
- Maintenance Engineer
- Controls Engineer (Mechanical Testing)
- Production Engineer
- Mechanical Systems Engineer
- Quality Manager (Thermal development)
- Environmental Test Engineer (Defence)

(Consultation - Please add/amend as relevant to industry needs in Wales and add a job description)

## Qualifications
**Competence qualifications available to this pathway**

| C1 - UK Standard for Professional Engineering Competence (Incorporated Engineer) | | | | | |
|------|---------|----------------------|--------------|-------------------------|----------------------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| C1a | N/A | Institute of Mechanical Engineers (IMechE) | N/A | Various | N/A |
| C1b | N/A | Institute of Engineering and Technology (IET) | N/A | Various | N/A |
| C1c | N/A | Royal Aeronautical Society (RAeS) | N/A | Various | N/A |

**Combined qualifications available to this pathway**

| Example: B1 - BEng (Hons) Aerospace Engineering | | | | | |
|------|---------|----------------------|--------------|-------------------------|----------------------|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| B1a | xx | Name of university/college | HE360 | N/A | N/A |

| Example: B2 - BEng (Hons) Robotics Engineering | | | | | |
|---|---|---|---|---|---|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| B2a | xx | Name of university/college | HE360 | N/A | N/A |

| Example: B3 - BEng (Hons) Maintenance Engineering | | | | | |
|---|---|---|---|---|---|
| No. | Ref no. | Awarding organisation | Credit value | Guided learning hours | UCAS points value |
| B3a | xx | Name of university/college | HE360 | N/A | N/A |

## Progression routes from the Degree Apprenticeship

After completing this Degree Apprenticeship, most apprentices will progress to:

- employment as an engineer in the job roles stated in this framework or similar job roles
- Masters Degrees in the relevant specialism
- monitored Professional Development to achieve Chartered Engineer Registration.


To get more information on careers and job opportunities for Incorporated Engineers we recommend you visit these websites:

http://www.engc.org.uk/ukspec.aspx

www.engc.org.uk/

www.theiet.org/

www.imeche.org


## Employee rights and responsibilities

Employee Rights and Responsibilities (ERR) is no longer compulsory, but Semta recommends that all apprentices receive it as part of their induction.

## How equality and diversity will be met

Semta recognises the training and business benefits of having apprentices from a wide variety of diverse backgrounds. We are committed to ensuring equality and diversity drives all aspects of apprentice selection and recruitment. Equal opportunity and diversity refers to the active elimination of unlawful or unfair discrimination against any person or group on the grounds of gender, race, colour, nationality, ethnic origin, religion, age, sexual orientation, marriage and civil partnership, pregnancy and maternity, political belief, disability and where appropriate, prison/offender background where this is deemed irrelevant.

Despite the encouraging numbers of both female participants and ethnic minorities on the Engineering Manufacturing framework at Level 3 upwards, the engineering sector still has a significant way to go to encourage women into engineering and manufacturing careers.

Semta has signed the United Kingdom Resource Centre (UKRC) CEO's charter in a bid to step up female recruitment in its key sectors and programmes. Due to impending skills gaps it is estimated that 187,000 people will be required to be recruited and trained between 2010-2016 within Semta's sectors of aerospace, automotive, composites, electrical, electronics, maintenance, marine, mathematics, metals and engineered metal products, renewables and science.

The UKRC is the Government's leading body for advanced gender equality in science, engineering and technology (SET) and the CEO's charter is a formal commitment to the UKRC's agenda to challenge the under-representation of women in SET. Women make up 50% of the labour market, yet they make up less than 20% of the labour market in science, engineering and technology.

The UKRC believes that only a concerted effort by the SET industry will break down the gender barriers that exist in traditionally male-dominated environments and we want to be part of a new consensus which will create an inclusive working environment for women. The manufacturing industries in which this scheme operates are traditionally dominated by a white, male workforce. However, faced with an aging workforce and the probability of skill shortages we must look to attract new entrants from a much more diverse recruitment pool. This means that all young people and adults considering engineering and manufacturing as a career are welcome, provided they meet the entry requirements.

Employers and Providers must be able to demonstrate there are no overt or covert discriminatory practices in the selection and employment of participants. This can be demonstrated by implementing a Single Equality Scheme (SES). The new Equality Duty (part of the Single Equality Bill) introduced to the public sector requires all public sector bodies to produce a SES combining their current race, disability and gender schemes and should be recognised by all providers of apprenticeship training. The implementation of a SES demonstrates the organisation's commitment to equality and diversity by identifying new and improved ways of working to ensure the organisation is more efficient and effective in meeting the diverse needs of both staff and customers.

All those who recruit participants on this scheme must comply with the Equality act of 2010 and apply the Equality and Diversity legislation taking full account of the following:

• The Sex Discrimination Act 1975 and Code of Practice

• The Race Relations Act 1976 and Code of Practice

• The Disability Discrimination Act 1995 and Code of Practice

• Employment Equality (Religion or Belief) Regulations 2003

• Employment Equality (Sexual Orientation) Regulations 2003

• Employment Equality (Age) Regulations 2006

• The Equality Act 2010

Employers and training providers must also actively monitor equality of opportunity and diversity procedures and take positive action where necessary to ensure equal access and treatment for all.

Download the guidance on the Equality Act here:

www.equalityhumanrights.com/advice-and-guidance/new-equality-act-guidance/

# On and off the job training

**Summary of on- and off-the-job training**

The time taken to complete the scheme may vary depending on previous experience and attainment of the participant. Where a candidate enters the Degree Apprenticeship having previously attained or acquired some or all of the appropriate competence or knowledge, this prior learning needs to be recognised and documented using the relevant Recognition of Prior Learning (RPL) procedures.

At Level 6 these apprentices will not be required to repeat training and qualifications already accumulated but will only be required to undertake the further competence and knowledge training as specified in the qualifications section of the relevant pathway.

Both on and off-the-job training hours need to be planned, reviewed and jointly evaluated between the apprentice, training instructor, tutor or lecturer and workplace supervisor and where relevant the apprentice's mentor. The apprentice should have access to training support at all times, whether on- or off-the job training.

On- and off-the job training hours should be delivered through a variety of learning methods, such as individual and group teaching, team-working, e-learning, distance learning, coaching, mentoring, feedback and assessment.

**Off-the-job training**

Off-the-job training is defined as time for learning activities away from normal work duties or away from the immediate pressures of the workplace.

The training hours required to undertake the chosen combined competency/knowledge qualification will vary according to the qualification and units selected.

**How this requirement will be met**

Off-the-job training needs to:

- achieve clear and specific outcomes which contribute directly to the successful achievement of the scheme and this may include accredited and non-accredited elements of the framework

- be planned, reviewed and evaluated jointly between the candidate and a tutor, teacher, leader or manager

- allow the participant access as, and when required to tutors, teachers, leaders or manager

- be delivered through one or more of the following methods: individual and group teaching, e-learning, distance learning, coaching; mentoring, feedback and assessment; collaborative/ networked learning with peers, guided study and induction.

It is recommended that a mentor is appointed for each apprentice to review their progress on a regular basis and all apprentices are entitled to receive at least one hour a week mentoring and this is included in the off-the-job training hours. It is recommended that a mentor may well exceed this one hour per week contact time as and when required with the degree apprentice. This activity will take place off-the-job and is inclusive within the off-the-job hours quoted in the previous section.

Evidence of off-the-job hours and off-the-job training must be formally recorded, either in a diary, workbook, portfolio or be verified by attendance records. This evidence needs to be checked and signed by the assessor and employer.

**Knowledge requirement**

In all cases these are accredited Engineering Honours Degrees that meet the benchmark statement that that defines the academic standard expected of graduates with an engineering degree. The defined learning outcomes are those published by the Engineering Council UK (ECUK) in the UK Standard for Professional Engineering Competence (UK-SPEC): The Accreditation of Higher Education Programmes.

These degree courses usually involve three years' full-time study or up to five years' part-time study. Those apprentices who have completed the relevant Foundation degree within the Advanced Manufacturing Higher Apprenticeship at Level 4, will not be required to undertake all five years of part time study specified for the Honours Degree, but may negotiate to enter the appropriate year of the part time degree course. In some cases the apprentice may need to study a bridging/top up course to do so.

Those Advanced Manufacturing Level 4 Higher Apprentices who have undertaken HNC or HND qualifications will need to discuss the entry requirements with the relevant University to establish what mitigation these qualifications might bring against the full course requirements. In most cases the apprentice will need to study a bridging/top up course to do so.

Providers will not be required to record individual on and off the job training hours. However for certification purposes, the provider will be required to declare that the apprentice has completed the on and off the job training hour requirement as set out in this Apprenticeship framework.

Training hours delivered under an apprenticeship agreement may vary depending on the previous experience and attainment of the apprentice.

The amount of off-the-job training required to complete the apprenticeship under the apprenticeship agreement may then be reduced accordingly, provided the total number of off-the-job hours for this framework can be verified for apprenticeship certification.

**On the job delivery**

This must be assessed in a work environment and must be assessed in accordance with specific Awarding Organisation's guidelines.

On-the-job training should:

- achieve clear and specific outcomes which contribute directly to the successful achievement of the scheme and this may include accredited and non-accredited elements of the scheme
- be planned, reviewed and evaluated jointly between the apprentice and a tutor, teacher, mentor or manager
- allow access as and when required by the apprentice either to a tutor, teacher, mentor or manager
- be delivered during contracted working hours.


How this requirement will be met

Examples of on-the-job guided learning in an engineering manufacturing context might be:
- environmental awareness
- employability skills
- team working and communications
- task-specific workplace instructions or team briefings

- taught sessions by the workplace line manager/instructor
- induction where activities are covered within normal work duties
- coaching of apprentices

Providers will not be required to record individual on the job training hours. However for certification purposes, the provider will be required to declare that the apprentice has completed the on-the-job training hour requirement as set out in this Degree Apprenticeship framework.

The amount of on-the-job training required to complete the apprenticeship under the apprenticeship agreement may be reduced accordingly for apprentices having previously attained or acquired the appropriate competencies or knowledge, provided the total number of on-the-job hours for this framework can be verified for apprenticeship certification.

Apprentices who commence training under a new apprenticeship agreement with a new employer may bring a range of prior experience with them. When an apprentice can claim a percentage or more hours towards the on-the-job framework total through prior learning acquired from previous full-time education, employment or other vocational programmes, then the apprentice's learning programme should include 'customisation'.

Training providers are encouraged to identify additional on-the-job training programmes that customise the learning to the new workplace. Customisation programmes may include selecting appropriate additional Unit(s) from qualifications, or relevant units recognised as Quality Assured Lifelong Learning (QALL) through a CQFW recognised body, following Essential Skills at a level higher than that specified in the framework or other competency-based qualifications/units relevant to the workplace.

All apprentices are required to generate evidence in the work place to demonstrate completion of the competence qualification, this may be through:
- apprentices generating a portfolio to record evidence of unit completion in accordance with the awarding organisation's requirements and this will be regularly reviewed by the assessor and mentor. A period of one hour per week has been set aside for mentors to review the ongoing progress of their apprentice

or

- apprentices generating portfolio evidence based on jobs undertaken will need to get this signed as having been completed by a responsible work colleague. This is then examined and agreed by the assessor as a contribution to demonstrating competence in the workplace.

Generation of portfolio evidence may be paper based, electronic with other mediums such as video evidence. Evidence may be gathered throughout the whole apprenticeship period.

**The range of evidence requirements for the Degree Apprenticeship are as follows:**
1. Copy of the Awarding Organisation certificate for the combined competency/knowledge qualification
2. Copy of Awarding Organisation certificates for Communication & Application of Number (Essential Skills Wales) or Key skills at the same level as Essential Skills Wales or Essential Skills Qualifications (ESQ)
3. Copy of the Awarding Organisation certificate for the ERR qualification or completed countersigned ERR workbook (if completed)

Consultation – Do they need to get IEng status to gain the apprenticeship certificate?  Or just be ready to apply after achieving it?

# Wider key skills assessment and recognition (Wales)

**Improving own learning and performance**
No longer required

**Working with others**
No longer required

**Problem solving**
No longer required

# Additional employer requirements

**Professional recognition as an Incorporated Engineer**

UK Standard for Professional Engineering Competence (Incorporated Engineer)

The competencies specified in the UK Spec are based on occupational standards developed for the main industries and services in which engineers are employed. There are no estimates as to the training hours required to complete the competence standards for IEng as it will vary widely between candidates depending on their previous competence training and experience.

Registration is open to everyone who can demonstrate competence to perform professional work to the necessary standards and commitment to:
- maintain their competence
- work within professional codes
- participate actively within the profession.

Anyone wishing to be registered must apply through one of the professional engineering institutions licensed by the Engineering Council (see www.engc.org.uk/ for a current list).

Candidates who believe they measure up to this Standard, or who wish to work towards registration, should approach one of the listed engineering institutions to obtain further details of how to apply for recognition and registration. The assessment process - known as a professional review - normally takes from one to six months, depending on the extent to which education and training is found to meet the standard requirements, the size of the chosen professional engineering institution and the availability of experienced assessors familiar with the branch of technology in which the applicant works.

The process of assessment starts with a written application made in accordance with the requirements of the particular institution concerned. A detailed description of the format for this will be provided by the institution, but any claim of qualifications, experience or training will need formal documented evidence. In submitting details, applicants will need to show how this relates to the required competences.

**What is professional competence?**

Professional competence integrates knowledge, understanding, skills and values. It goes beyond the ability to perform specific tasks. The formation process through which engineering professionals become competent generally involves a combination of formal education and further training and experience (generally known as professional development). However these different elements are not necessarily separate or sequential and they may not always be formally structured.

The UK Standard For Professional Engineering Competence set out the threshold generic competence standard for registration as an Engineering Technician, Incorporated Engineer or Chartered Engineer, and include some examples of the kind of evidence which would help demonstrate these. The exemplifying educational requirements for each category of registration are also given. The standard has widespread support and is based on occupational standards developed for the main industries and services in which engineers are employed.

**Assessment of competence**

To become registered, applicants must have their competence assessed through a process known as professional review. The assessment is by practising engineering professionals, trained in this kind of assessment. Applicants are assessed against the competence standards listed in the UK Standard For Professional Engineering Competence document, which may be adapted by the institution to relate specifically to the particular technologies or industries with which it is concerned.

**Mentorship**

Each apprentice must have an appointed mentor at the start of training to advise them on the evidence they need to accumulate to meet the Incorporated Engineer Standard. In large engineering companies there are Chartered Engineers who can perform this role. Apprentices should receive regular reviews by their mentor at least on a quarterly basis to ensure progress is properly monitored. Those apprentices who work for small and medium sized companies should contact their Institution to arrange mentorship.

**Recording of evidence**

Each apprentice must develop a portfolio of evidence he or she has accumulated against the Incorporated Engineer Standard. Most Institutions have an electronic portfolio format that apprentices may use to record progress and evidence against the standard. The types of evidence may be varied but could include the following:

- work-based assignments
- practical tests
- examinations
- work based projects
- dissertations

Apprentices should identify arrangements for evidence recording and mentorship on joining the institution of their choice. The Institute of Mechanical Engineers (IMechE), the Institution of Engineering and Technology (IET) and the Royal Aeronautical Society (RAeS) endorse this framework and will be able to offer advice and guidance. The process is as follows:

1. Professional Engineering Institution approves the Degree Apprenticeship framework at Level 6
2. Apprentice applies for membership and joins an appropriate professional engineering institution
3. Institution allocates a mentor and supplies any related information, plus access to a PD record system where available

4. Apprentice accumulates relevant evidence against the UK-SPEC (IEng) competence requirements through their working experience and the vocational qualification element of their programme. The mentor provides advice on how to keep an appropriate record of this and, in due course, on completing the application for IEng.
5. Apprentice submits IEng application to the Institution, who review the application and may request further details of experience or other supporting evidence
6. At either of these stages, the apprentice may be advised of any shortfall allowing the apprentice to address this
7. Apprentice invited to attend a Professional Review interview.
8. Apprentice is awarded IEng or advised how to address any shortfall.

**Other useful forms of reference**

The Engineering Council is the UK regulatory body for the engineering profession. EC UK hold the national registers of 235,000 Engineering Technicians (EngTech), Information and Communications Technology Technicians (ICTTech), Incorporated Engineers (IEng) and Chartered Engineers (CEng).

**Web links**

http://www.engc.org.uk/engcdocuments/internet/Website/Student%20guide%20to%20professional%20registration.pdf

www.engc.org.uk/

www.engc.org.uk/professional -registration/

www.theiet.org/

www.imeche.org

http://www.aerosociety.com/