Skills Development Scotland

Enginuity

A Foundation Apprenticeship in Engineering at SCQF level 6

GR93 46

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Review Date	
End Date	
Version	1.1

This document provides the information required to deliver a Foundation Apprenticeship in Engineering.

If you need any further information please contact:
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Version Control			
Version Number	**Revision(s)**	**Approved by**	**Date**
1.0	New Framework Specification post FA developments	Frank Quinn	**October 2020**
1.1	Addition of GR93 46 Revised Temporary Framework	Deborah Miller	**September 2021**
1.2	Removal of GL7A Group Award and Update of Assessment Arrangements	Deborah Miller	**September 2024**

Background

One of the key recommendations of Sir Ian Wood's review on developing the young workforce was to "develop better connectivity and co-operation between education and the world of work to ensure young people at all levels of education understand the expectations of employers, and that employers are properly engaged" (Scottish Government response to "Developing the Young Workforce; 2015). The Scottish Government set ambitious targets to ensure this connectivity is delivered through a partnership of schools, colleges/training providers and employers.

Skills Development Scotland (SDS), alongside other partners, is working with industry to increase the range of work-based learning opportunities for pupils in the senior phase of secondary schools. One of the ways this is being achieved is through the development of Foundation Apprenticeships and SDS is leading this initiative. Foundation Apprenticeships will allow pupils to gain vocational qualifications that combine sector specific skills alongside the knowledge that underpins these skills in a workplace setting while still at school.

The Foundation Apprenticeship in Engineering is designed to provide Senior Year 5 (S5) and Senior Year 6 (S6) pupils opportunities to develop skills and knowledge for entry into a career in the engineering sector. It also contributes directly to achievement of the Modern Apprenticeship in by attainment of core units of the MA qualification.

The Engineering sector in Scotland

In the UK, there are 145,800 Advanced Manufacturing and Engineering establishments employing 1.7m people creating a turnover of £321bn. The sector employs 6% of the total UK workforce with 26% of all employees having completed an apprenticeship.

Engineering Enterprises in Scotland employ over 144,000 people across 12,000 establishments. Scotland accounts for about 8% of engineering employment in the UK. In terms of employment by sector: 24,000 are employed in metals, 50,100 in consultancy, testing and analysis, 10,000 in Electronics, 21,400 in mechanical equipment, 4,500 in aerospace and 14,900 in research and development, with the remaining 17,100 in other related industrial groups.[1]

It is estimated that 55% of the workforce in the sectors in Scotland are employed in direct technical roles such as engineers, scientists and technologists.

Why choose Engineering?

Engineering is a challenging, exciting and rewarding career that presents a wealth of opportunities for Scotland's young people to enter a diverse and often unique field of work including research, design and development and manufacturing. The sector continues to expand and grow, and the Scottish Government recognises the sector as one of the key economic priority areas for investment.

The sectors include:

- Metals (including Metal Products and Wholesale Metals)
- Mechanical equipment
- Electrical equipment
- Rubber tyres (manufacture and repair)
- Other Transport equipment (other than aerospace, automotive and marine)
- Electronics
- Marine – boat building and ship building and repair
- Aerospace
- Automotive
- Other Engineering activities (including technical testing and analysis)

[1] **Source:** Estimated by Enginuity from BRES 2013 and N.I Census 2013 data.

- Science Industries (R&D in natural sciences and Engineering)

The scope of Engineering also includes other related Energy and Power industries and includes:

- Transmission and Distribution
- Oil & Gas
- Renewables
- Construction
- Energy Management and efficiency
- Emerging Technologies

Apprenticeships – A recent Enginuity Labour Market Skills Survey indicates that 30% of all Engineering establishments within Scotland employed apprentices or recognised trainees. Within the Engineering sectors the proportion employing apprentices or recognised trainees ranged from 19% of electrical equipment and electronics establishments to 57% of other transport equipment establishments.

What is the Foundation Apprenticeship in Engineering?

The Foundation Apprenticeship (FA) in Engineering is for pupils in S5 and S6 and typically takes two years to complete. Increasingly the framework is also available over a shorter duration, typically a single academic year.

Irrespective of the delivery model, the Engineering framework includes two core elements, namely:

1. National Certificate in Engineering
2. Performing Engineering Operations units

The full programme specification is outlined further in this document.

Background / rationale

This Foundation Apprenticeship supports the commitment to provide relevant work-based vocational education and training as part of the senior phase curriculum. This will prepare young people for direct entry into a career in the science sector by equipping them with the necessary skills and knowledge to work effectively from day one of employment. This includes both the development of practical and technical skills alongside the development of learner meta-skills, supported via project-based learning. It also highlights meaningful vocational pathways as challenging and valuable alternatives to existing academic subjects.

Partnership

A Foundation Apprenticeship is about the right balance between delivering the taught elements of the programme and the development of work-based competences the meta-skills and work-based learning elements.

Development of true competence depends on the continuing acquisition and application of underpinning skills and knowledge. Young people need to build real workplace skills including both those that are specialist to the chosen career and the generic behaviours and attributes that apply to any workplace. This is achieved in a real work setting involving meaningful activities introduced throughout the programme.

Foundation Apprenticeships are delivered by partnerships comprised of school, learning provider and employer. The learning provider is responsible for the approvals, delivery, assessment and quality assurance of the component units and qualifications. Where multiple learning providers are involved, arrangements between them will be detailed in an SQA Partnership Agreement.

The learning provider must have the appropriate SQA centre and qualification approvals in place before it can deliver the Foundation Apprenticeship.

For further support and guidance on SQA's approval, quality assurance processes and SQA Partnership Agreements, please see:

https://www.sqa.org.uk/sqa/79474.html

Employers are an essential part of the partnership and can contribute in a range of ways, from creating a workplace challenge, to coaching and mentoring, to interviewing and selection. They may also be involved in the assessment of the work-based learning element.

Pastoral care

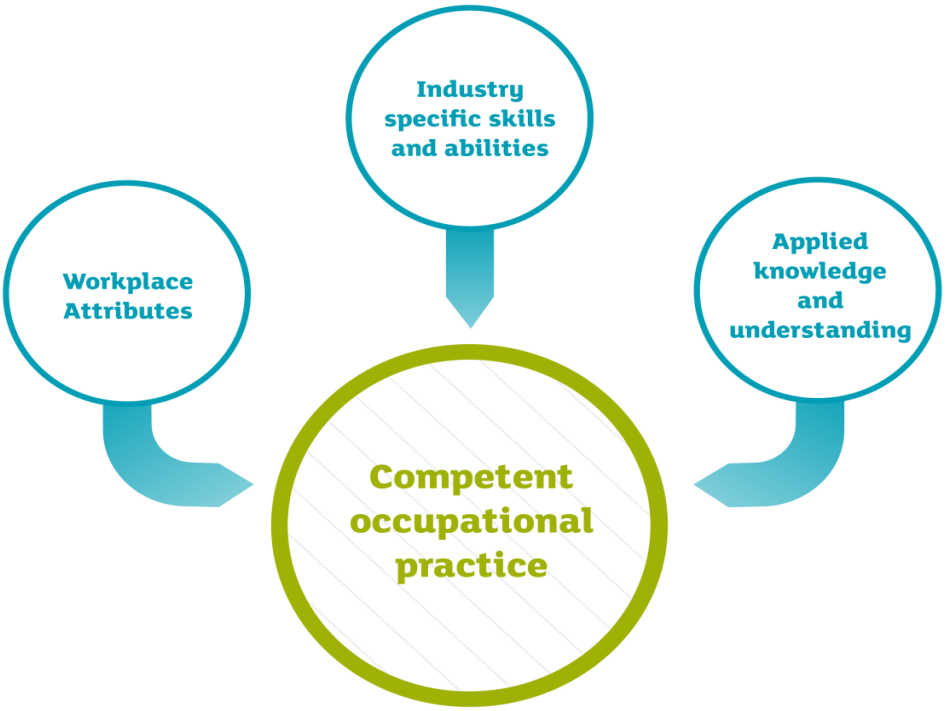
The young people embarking on this Foundation Apprenticeship are school pupils and therefore all those involved in delivering the programme have a duty of care. This includes providing appropriate health and safety training and measures to ensure the safety of the young people, including relevant safeguarding requirements that are required by respective Local Authority and School partners. This must be in the context of the specific workplaces of the individual pupils (one of the mandatory units of the FA covers health and safety).

In addition, a workplace mentor must be assigned to be a point of contact for the young person when they are not in the school environment.

Work placement allocation and methodology, whether on-site or through remote working, should take cognisance of the learner's personal circumstances to maximise the learner experience and opportunity.

How should the Foundation Apprenticeship be delivered?

The following diagram illustrates the outcomes achieved for pupils and for employers from bringing together the essential elements of work-based learning in a Foundation Apprenticeship.



National Certificate Engineering (SCQF Level 6)

The NC in Engineering at SCQF level 6 will prepare pupils with the practical skills and knowledge needed for access to higher level study or to move into employment. It can also provide credit and progression to the Engineering Modern Apprenticeship Framework at SCQF level 6.

Providers should note that the primary focus of SCQF level 6 outcomes is different from that of the level 5 SCQF award in that it has been designed to provide a balance of relevant technological principles and practical applications suitable for participants that aspire to work at technician level.

For the purposes of an example of a permitted NC qualification at SCQF level 6 the attainment of the National Certificate in Engineering Systems requires the achievement of 12 SQA credits (1 SQA credit = 6 SCQF credits) of which 8 must be at SCQF level 6. Participants are required to complete 3 Mandatory SQA credits at SCQF level 6 plus 5 restricted Core credits at SCQF level 6 and a further 4 optional credits at SCQF level 5 or 6 depending on subject choice.

The minimum needed to attain the National Certificate component of the Foundation Apprenticeship is 8 NC Core / restricted core units plus 4 optional units with a minimum tariff value of 50 SCQF points to be gained at SCQF level 6.

Evidencing across qualifications

Lead partners are encouraged to consider using evidence across qualifications and to cross reference where appropriate. For example, SVQ PEO (Performing Engineering Operations) evidence may be used as evidence for NC (National Certificate) units where this is appropriate. Evidence used in this way must be carefully tracked, agreed and externally quality assured by the relevant awarding organization(s).

NC Project, PEO & work-related experience

Providers should review the criteria for any NC Project outcome where it exists, and seek to align the activity with a relevant Industry Challenge project and employer work experience as part of the delivery. In addition, where appropriate, SVQ Performing Engineering Operations at SCQF level 5 can be combined to provide candidates with opportunities to acquire a wide range of skills and knowledge also. Providers will work with partners to determine the required frequency of attendance at their college or provider centre to deliver and achieve stated outcomes. The principles relating to the transfer and use of evidence from other sources applies as do arrangements in respect of external quality assurance.

Performing Engineering Operations Level 2 (SCQF Level 5) GR5N 22

The SVQ in Performing Engineering Operations is intended for people starting a career in Engineering or manufacturing, or are employed and are carrying out engineering tasks. They will require skills and knowledge in Health and Safety, be able to interpret technical information and be competent and familiar with managing their own personal workspace whilst carrying out a range of engineering activities. The SVQs are designed to be assessed in the workplace, or in conditions that reflect the workplace. Examples of the settings in which the SVQs are likely to be delivered include: workshops in highly supervised and controlled environments, colleges, training providers, and employer approved environments. The concept of a Foundation Apprenticeship is that pupils should have an opportunity to be in a real-world setting and strong local partnerships with employers are necessary to achieve this aim.

Please refer to the Foundation Apprenticeship Product Specification for further information on the principles of Foundation Apprenticeship delivery.

Please refer to Annex 4 at the end of this document for a detailed breakdown of the units and codes within the FA Engineering framework

Governance and quality

As with the Modern Apprentice programme Enginuity attaches significant value to the quality of the delivery of programme content and experience for those participating and achieving the outcomes of the Foundation Apprenticeship. To support continuity and consistency of delivery all those organisations leading delivery should be approved by Enginuity and recognised by Enginuity's existing Modern Apprenticeship approval delivery arrangements and existing criteria.

Certification

SQA will issue the commemorative certificate for the Foundation Apprenticeship.

Depending on the professional qualification unit pathway chosen, learning providers must ensure that they have appropriate approvals in place with [the relevant awarding bodies (SQA and EAL where relevant) for the Foundation Apprenticeship and all mandatory components. Candidates must be entered and resulted for all relevant units for verification and certification purposes.

Once all contributing results are entered on SQA systems, the candidate's commemorative certificate will be produced.

SQA Awarding Body quality assurance requirements apply to the delivery of the SQA component units and group awards. Centres are required to sign up to the relevant Assessment Strategy for the SVQ and comply with all its requirements.

Selecting an Industry Challenge in an Engineering setting

To help support practice, training providers or colleges working directly with employers may set up an "industry Challenge" project. This can be done as a group activity to help introduce a concept or as an individual's own challenge. It is important that the Industry Challenge reflects everyday work experience for the pupils. At all stages the partnership between the school, Training Provider / FE college and employer is critical to the success of the challenge and so the outcome of the Foundation Apprenticeship. Examples of challenges might come from evidence of improvements or enhancements identified by the employer in their production and manufacturing environments, the need for technological change or specific industry and client-based project matter. Current Engineering Education Schemes that senior phase pupils are actively engaged in with employer support should also be considered as to whether they can support the outcomes of the Industry Challenge requirements.

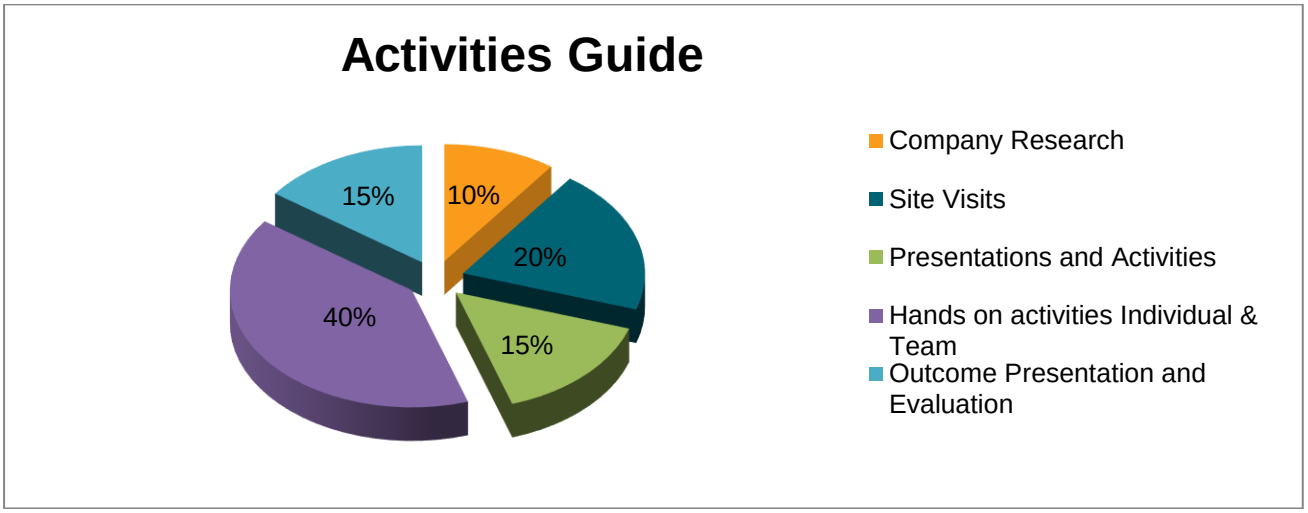
Any framework for an Industry Challenge Project should contain the following criteria:

- Based on real life work
- Contain SMART tasks and objectives
- Project outcomes are assessed against agreed criteria
- Delivered and led either in employer or FE/ provider environments
- Resourced by industry
- Specified by industry
- Supported by industry
- Industry Challenge projects should be around 100-150 notional learning hours.

Industry Challenge projects can be group or individual orientated.

Annex 2 provides further notes and timetable example

The chart below shows how activities might be segmented for the purposes of an Industry Challenge Project.



Activities	Creativity and Motivation	Teamwork	Organisation & Planning	Critical thinking & problem solving	Understanding Career Opportunities	Self-Management	Understanding the Business	Language Skills & Numeracy
	Skills & Competencies							
Company Research & Fact Finding			√		√		√	
Company Introduction & Presentation		√					√	
Company Site Visits	√		√		√			
Project Planning & Resource			√	√		√		√
Project Delivery and Hands-on Activities	√	√	√	√		√	√	√
Evaluation Project Reporting & Outcomes	√	√	√	√	√	√	√	√

Industry visits

Industry visits are useful and important to the pupil's sense of motivation. The visits provide the opportunity to engage with employers whilst seeing and understanding the workings of a variety of engineering sectors. Evidence supports that this inspires and motivates the pupils informing them of potential positive destinations.

Selection of pupils and entry requirements

The Foundation Apprenticeship in Business Skills is aimed at pupils with an interest and enthusiasm in exploring this area of work. Although set at SCQF L6, due to the contextualised learning experience where underpinning theory and practice are aligned with industry, learners operating at SCQF L5 or above on arrival are encouraged.

Equalities

We expect those involved in the development, recruitment and delivery of Foundation Apprenticeships to be pro-active in ensuring that no-one should be denied opportunities because of their age, disability, gender reassignment, marriage and civil partnership, religion or belief, sex or sexual orientation or pregnancy and that any barriers (real or perceived) are addressed to support all pupils. These are the protected characteristics of the Equality Act 2010 and training providers and employers must comply with this Act to ensure that applicants are not discriminated against in terms of entry to and promotion within the industry.

Our emphasis throughout is upon equality and diversity both for new entrants to the sector and opportunities for progression for the existing workforce.

Learner Progression

Foundation Apprenticeships are directly aligned to three primary progression pathways. These are:

- Modern Apprenticeship
- Further Education
- Higher Education

Modern Apprenticeship:

A pupil completing the Foundation Apprenticeship in Engineering will have achieved a large proportion of the requirements for a Modern Apprenticeship in Engineering at SCQF level 6.

Learners may also progress to a Modern Apprenticeship in Engineering at SCQF level 7.

Further Education:

All Scottish further education colleges recognise the Foundation Apprenticeship in Engineering as an eligible qualification towards Higher National provision, alongside other qualifications.

Higher Education:

Scottish universities recognise the Foundation Apprenticeship in Engineering as an eligible qualification towards under-graduate degrees and graduate apprenticeship provision, alongside other qualifications.

Recognition of prior learning

SQA's policy is to recognise prior learning as a method of assessing whether a learner's experience and achievements meet the evidence requirements (i.e. the standard) of a SQA Unit or Units and which may or may not have been developed through a course of learning.

More information can be found on the **SQA website**.

Further information

Further information about Engineering and Engineering education schemes can be found on the Enginuity website and also at the following:

https://www.enginuity.org/news-events/career-pathways-helping-employers-explain-the-routes-into-engineering-to-young-people
www.theiet.org
www.adsgroup.org.uk
www.esp-scotland.ac.uk

www.opito.com/about
www.euskills.co.uk/our-industries
https://www.etrust.org.uk/routes-into-stem-read-more
https://www.engineeringuk.com/about-us/overview/

To further encourage young people into industries across Science, Technology Engineering and Maths the sector has enlisted people who currently work in all types of Engineering and STEM-related activities. These volunteer ambassadors can provide information on careers in STEM across Scotland as they inspire a new generation to join the sector.

Find further information at: **https://enginuity.org**.

Enginuity

The framework and content of this Foundation Apprenticeship has been agreed with, and supported by Enginuity. Enginuity are the Sector Skills Council for the Engineering and Advanced Manufacturing sector – **www.enginuity.org.uk**

In agreeing the framework Enginuity is providing the following information to employers and to pupils.

Those participating in the Foundation Apprenticeship in Engineering who successfully complete the programme and components will achieve a National Certificate in an Engineering discipline at SCQF level 6 and 3 units of Performing Operations SVQ at SCQF level 5. This content is recognised as part of the full Modern Apprenticeship in Engineering and is a significant achievement towards the required components. Participants who go on to complete the Modern Apprenticeship in Engineering will be required to complete a further 3-5 PEO (Performing Engineering Operations) SVQ units and a further SVQ in an Engineering discipline at SCQF level 6/7) and requisite Core Skills units.

Those participating in Foundation Apprenticeship in Engineering will be provided with a full certificate value to show their achievements.

The Foundation Apprenticeship in Engineering is designed to be flexible and support a significant wide range of opportunities that arise within sector, and equally be recognised for purposes of further study.

A young person either seeking progression direct into industry or that of advanced further or higher education study will have both knowledge and capability to undertake further progression. Those sectors and industries represented by Enginuity, and those closely aligned, support the Foundation Apprenticeship initiative.

Annex 2

Exemplar Timetable /Framework

The exemplar timetable below is for a manufacturing Industry Challenge project over a period of 10 days and shows the added-value components, provided by a potential employer and college / provider together.

Day 1

- Introduce Client / Employer & product specification
- Task / Product discussion, duration and induction
- Employer site visit & project resource needs
- PPE & general Health and Safety

Day 2

- Project client brief
- Project personnel & roles and responsibilities established
- Project planning and skills assessments
- Project plan and format of activities recording agreed

Day 3

- Project planning & development
- Visit from client
- Health & Safety site & project issues identified

Day 4

- Project development
- Preparation of project materials

Day 5 /6

- Client / Employer visits and project presentation
- Project delivery

Day 7

- Project delivery & review of progress
- Confirmation and review of any agreed timelines for final outputs

Day 8 / 9

- Project final stages
- Project completion
- Client / Employer visit for review and confirmation of outputs
- Updating and review of accuracy of project records
- Preparation for client handover and commissioning

Day 10

- Client Employer reception and project process presentation
- Review and evaluation and completion of records
- Creation and recording of personal learning experience via portfolio

Notes

Industry Challenge – Project Component

Background and Guidance

The Project is a major component of Foundation Apprenticeship work-based learning pathway. There are number of key principles that underpin the project including:

- Based on real work
- SMART tasks
- Be capable of being assessed

Projects by their very nature can be created, managed, delivered and assessed in Employer environments or simulated environments including FE College Engineering workshops and that of Private Training providers. The guiding principles for all projects whether delivered in Employer environments or simulated Engineering workshops are that the projects are specified by industry, resourced by industry, supported and assessed by industry. Projects can either be led by Employers or the Education and Training organisation.

Key features of the project will include:

- Induction
- Health & Safety brief
- Project structure
- Project content (student & employer)
- Communication
- Evaluation
- Accreditation (where relevant)

The Industry Challenge project has the ability, where well managed and co-ordinated, to provide an opportunity to extend access to a wide range and diversity of employers to become actively engaged though support is likely to be in a simulated workplace. Simulated Engineering workshop environments include both FE College and Private Training Provider dedicated facilities. Such an approach would be supportive of SME's engagement in addition to other larger employers and allow them to contribute successfully whilst not be committed to using their own on-site environments. Projects delivered in simulated environments would be delivered to an agreed scope and standard using a framework as identified previously.

Employers should be actively encouraged to participate in the project activity, delivery and outcomes, and education partners should set out clearly their expectations for employer engagement and participation. Well managed and delivered projects will see employers specify the task, provide resources as appropriate and support the delivery and completion of the task. An example of how employers might provide resource could include the use of Modern Apprentices to work closely with Foundation Apprentices on the project and agreed delivery outcomes. This additionally has the benefit for Foundation Apprentices to work alongside positive role models. Furthermore, employers benefit from the mentoring skills that Modern Apprentices develop.

Annex 3:

Foundation Apprenticeship in Engineering: Energy Option

Background

Energy is a Scottish Government key sector and development work took place in 2015 to design a Foundation Apprenticeship specifically for the Energy sector. The consultation and development was led by the Energy Skills Partnership.

The Energy Skills Partnership established a collaborative model to increase Scotland's capacity to deliver skills and prevent duplication of effort and investment for the energy, engineering, construction and emerging technologies by ensuring capacity, quality and affordability. Through this consortium approach Scotland's colleges are ensuring that the right skills are being delivered and raising industry awareness to ensure Scotland has the workforce, skills and competence required by the energy sector in the future.

The partnership scope includes the development and delivery of education and skills provision across identified industrial themes:

- Engineering
- Energy
- Renewables
- Transmission and Distribution
- Oil and Gas
- Construction and Energy Management and Efficiency
- Emerging Technologies

Energy Skills Partnership's consultation led to agreement between parties that the Foundation Apprenticeship for Engineering meets the needs of the energy sector.

Additional Energy Activities

Energy-specific site visits
Presentations by & activities with STEM ambassadors from Energy sector
Energy-specific Industry Challenge (in line with general Engineering guidelines).

Foundation Apprenticeship Framework Specification: Engineering at SCQF Level 6

Providers can use any of the following National Certificate qualifications options as the required National Certificate to underpin the programme and in addition must deliver three mandatory units of SVQ Performing Engineering Operations.

GR93 46 Foundation Apprenticeship in Engineering			
Award Title	Unit Title and SQA Code	SCQF level	SCQF Credit points
One from:			
G9CC 46 NC in Engineering Systems	as per NC specification	Individual unit levels vary. NC contains at least 36 SCQF credits at level 6.	72
G97J 46 NC in Mechanical Engineering	as per NC specification		72
G97H 46 NC in Aeronautical Engineering	as per NC specification		72
G9AF 46 NC in Electrical Engineering	as per NC specification		72
G9AG 46 NC in Electronic Engineering	as per NC specification		72
G984 46 NC in Fabrication and Welding Engineering	as per NC specification		72
G97L 46 NC in Manufacturing Engineering	as per NC specification		72
G987 46 NC in Measurement and Control Engineering	as per NC specification		72
GR5N 22 SVQ in Performing Engineering Operations at SCQF level 5 (part of) *	HE9D 04 *[EAL Code SPE02/001A]* Complying with statutory regulations and organisational safety requirements	5	5
	HE9C 04 *[EAL Code SPE02/002A]* Using and Interpreting Engineering Data and Documentation	5	5
	FR0T 04 *[EAL Code SPE02/003A]* Working efficiently and effectively in engineering	5	5
Foundation Apprenticeship Certification Unit	HE6E 04 Foundation Apprenticeship Certification unit	-	0
TOTAL SCQF CREDIT POINTS			87