Higher Apprenticeship Standard for:
Aerospace Software Development Engineer
The following standard reflects employers' requirements for the skills, knowledge and behaviours expected from someone to be competent in the job role.

Role Profile

Software Engineers are predominantly involved in the discipline of Software Engineering, however aspects of Modelling and Simulation, Human Factors and Systems Engineering disciplines are also covered as essential background for a fully rounded software engineer.

During the Concept, Assessment, Demonstration and Manufacture life cycle phases, Software Engineering is focused on influencing product architecture to accommodate modification and upgrade throughout product lifecycle. Software is an intrinsic component of the systems used to deliver in-service support. Following the in-service date, Software Engineering delivers support, optimises and upgrades the Support System infra-structure. These are considered to be Sustainment activities.

All engineers must comply with statutory regulations and organisational safety requirements. They must be able to use and interpret engineering data and documentation such as engineering requirements, specifications, designs, code, test specifications, test scripts, code analysis (static and dynamic) tool output.

Software engineers will be expected to work both as individuals and as part of wider Engineering teams. They will be expected to demonstrate coding ability and specify, analyse, test and modify Software Engineering artifacts across Design and Development and In-Service Operations. They will be expected to validate, test and modify software to comply with its design and associate requirements.

The requirements are designed to offer stretch and progression. Higher Apprentices will be able to work with appropriate supervision, whilst taking progressively more responsibility for the quality and accuracy of the work they undertake. They will be proactive in finding solutions to problems and identifying areas for improving the business.

Knowledge & Skills

Aerospace Software Development Engineeers are able to demonstrate:

Knowledge:
understanding of the fundamentals of Software Engineering Practice, apprentices will be able to describe all of the phases of the software Lifecycle and the interfaces between each phase
understanding of configuration management and software build processes, apprentices will understand the methods & tools used to control the change and modification of software related products
understanding of analytical methods (engineering mathematics), apprentices will understand the use mathematics and associated toolsets to reason about properties of software such as safety or performance
understanding of "Modelling & Simulation" software, apprentices will understand how to develop software more quickly and reliably utilising "Modelling" toolsets

Skills:
complying with statutory, quality, organisational, environmental and health and safety regulations, apprentices will seek opportunities to show compliance with appropriate standards
reading and interpreting Software engineering data, apprentices will demonstrate an understanding of code, design and requirements documentation
applying configuration management and software build processes, apprentices will gain experience of the methods & tools used to control the change and modification of software related products
developing and applying Algorithms, including specification, design and implementation, apprentices will construct algorithms required to implement required functionality in software
applying appropriate Engineering Operations and Toolsets, apprentices will use the standard methods adopted for software production and the toolsets deployed to support efficient development
applying analytical methods (engineering mathematics), apprentices will use mathematics and associated toolsets to reason about properties of software such as safety or performance
applying Systems Engineering principles, apprentices will learn the criteria for making architectural decisions in order to achieve an optimal solution over potentially conflicting system objectives
using “Modelling & Simulation” software, apprentices will learn how to develop software more quickly and reliably utilising “Modelling” toolsets
applying business improvement techniques ensuring optimisation of processes, resources and budget, apprentices will use systematic methods to identify and eliminate waste and inefficiencies in their software production activities

Behaviours

The required behaviours are:

1. **Knowledge and understanding**
   Commitment to continue personal development, refreshing and expanding Engineering knowledge through a variety of methods.
2. **Design and development of processes, systems, services and products**
   Contributing to the continuing development of Engineering within their domain
3. **Responsibility, management or leadership**
   Taking personal responsibility for their actions, Managing projects, including resource management within their remit.
4. **Communication and inter-personal skills**
   Be able to demonstrate a range of communication styles and methods. Understanding the importance of networks within and across functions.
5. **Professional commitment**
   Demonstrating a personal and professional commitment to society, their profession and the environment, adopting a set of values and behaviours that will maintain and enhance the reputation of the profession.

Entry Requirements

Academic qualifications of 240 UCAS points or above at A-Level standard or equivalent, to include Maths plus at least one further STEM based subject such as Physics, ICT, Computing, Electronics. Plus Five GCSEs at Grade A-C including Mathematics, English Language and Double Science or equivalent qualification. Apprentices without Level 2 Maths and English must achieve this prior to taking the end point assessment.

Typical Duration of Apprenticeship

Typically 48 months - timescales may vary depending on occupational role and/or prior relevant qualifications / experience and Assessment of Prior Learning and Knowledge (APL/K) opportunities.

Mandatory Qualifications

- Level 4 Diploma in Engineering and Advanced Manufacturing (Development Competence)
- Level 6 Bachelor Honours Degree (BEng or BSc) Stipulated by the employer and accredited by an Engineering Council licenced Professional Engineering Institution

All of the qualification requirements in the foundation and development phases are mandatory outcomes for the completion and final certification of the Apprenticeship Standard. Each qualification has a core and options approach and employers will select the most applicable pathway and unit options to meet their organisational requirements.
There will be an end point assessment during the final phase of the Apprenticeship where the apprentice will need to demonstrate to the employer how they have achieved full occupational competence against, skills, knowledge and behaviours, set out in the Standard On successful completion of the End Point assessment and employer endorsement phase (final sign off) apprentices will be then be put forward to be awarded their Apprenticeship completion certificate.

Recognition

This Apprenticeship Standard aligns with the current edition of the UK Standard for Professional Engineering Competence (UK-SPEC) at Incorporated Engineering (IEng) level. The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for IEng and reaches the agreed level of professional competence as defined in the Assessment Plan.

Level and Review

This Apprenticeship Standard is at Level 6 and will be reviewed as a minimum every three years.