

Electronic Systems Principal Engineer Apprenticeship Standard – DRAFT FOR CONSULTATION

Introduction

This is a working **DRAFT** of a new Apprenticeship Standard, produced by our Trailblazer Group, for the occupation of **Electronic Systems Principal Engineer**. This will be a Level 7 (Masters Level) standard, designed for post-graduate engineers. The Institute for Apprenticeship (IfA) has approved the proposal for the Standard (see [here](#)) and we have written this draft in line with their latest guidelines (see [here](#)). As part of the development process we must consult widely to give employers and other relevant organisations who have not been directly involved in the Trailblazer Group an opportunity to input. Therefore, if you have any comments or input please pass them to stewart.edmondson@ukesf.org before **22nd June 2018**.

If the standard is approved, the published version will need to contain an occupational profile. This consists of a summary of the occupation and a list of the duties that the individual will need to be able to do. This information must relate to what an individual who is fully competent in the occupation needs to be able to do rather than what an individual needs to be able to do during their apprenticeship.

Occupational Profile

This occupation is found in.....

The Electronic Systems sector. Electronic Systems are found in all parts of the economy: consumer electronics, automotive, defence, healthcare/medicine, digital/media/communications, robotics, AI and the manufacturing industries. An Electronic Systems Principal Engineer will possess a high level of knowledge and skill in both hardware and software engineering and an understanding of the practical realities of the design and operation of real systems. They will also possess knowledge in specialist subjects such as: Digital Signal Processing (DSP), analogue Electronics, RF Engineering/communications and real time computing.

The broad purpose of the occupation is.....

Technical leadership for Electronic Systems projects. The Electronic Systems Principal Engineer will have considerable responsibility and influence. They will be accountable for Electronic Systems projects from concept creation, through translation of concept requirements into executable plans, defining designs, verification, testing, implementation and operational usage. They will undertake lead technical change, provide innovation and mentor junior colleagues in all areas related to Electronic System projects.

In their daily work, an employee in this occupation interacts with.....

A wide range of both internal and external stakeholders. Internally these would include members of inter-disciplinary project teams, engineers from other disciplines, general managers and the senior leadership of the organisation. Externally they would include customers, suppliers, certification organisations, professional bodies and regulatory authorities.

An employee in this occupation will be responsible for.....

Making engineering decisions relating to Electronics Systems, mitigating technical risk and controlling engineering resources. The Electronic Systems Principal Engineer will be operating as a locally acknowledged expert and will most likely have experience across all project lifecycle phases. They are likely to be accountability for project, finance and personnel management and managing trade-offs between technical and other factors. They will be responsible for ensuring technical solutions are robust, innovative and in line with customer expectations. They are likely to hold formal Delegated Authority. They will also have the skill sets necessary to develop other engineering and technical staff involved with Electronic Systems.

Duties

An occupational profile should typically contain the 10-20 duties that make up the occupation. These should be the duties that a *fully competent employee should be able to undertake when working in the occupation*. They are drafted as 'doing' statements. In the occupation of Electronics Systems Principal Engineer, a fully competent employee can:

Ser No	Focus Area	Duty In this occupation, as an Electronic Systems Principal Engineer, a <u>fully competent</u> employee can:	Criteria For measuring performance	Knowledge Skills Behaviour (KSB)
1	Technical & Engineering Knowledge	Serve as a recognized leader in understanding the state of the art in own technical specialty in order to effectively apply technology to current and future Electronic Systems projects and products.	Feedback from internal/external customers and peer group is in line with expectations.	K1, K3, S3 and B3.
2	Innovation, Emerging Technology	Remain current with advances in their own technical specialty. Apply this knowledge to develop performance enhancements, design improvements, cost reductions and problem resolution.	Advances in technologies are reflected in the quality and quantity of ideas and proposals and are in line with expectations.	K1, K3, S3 and B3.
3	Requirements	Translate customer requirements into clear specifications and design solutions.	Requirements accurately captured, understood and translated into specifications.	K2, S1 and S5.
4	Technical Solutions	Apply creativity and innovation to devise effective technical solutions.	Quality of solutions is in line with expectations.	K1, K2, S2 and S3.

5	Design	Moderate and lead technical “what if” scenario discussions. Support risk analysis mitigation planning for Electronic Systems. Lead design reviews and other technical meetings.	Outcomes of design review meetings/discussions and other meeting in line with expectations.	K3, S1, S4, S5, B1, B2 and B4.
6	Technical Decision Making	Take responsibility for the technical aspects of Electronic Systems development throughout the product lifecycle. Make technical decisions and mitigate technical risk within own sphere of responsibility and delegated authority.	Quality of technical solutions to time/cost/performance parameters.	S2, S4, S5, B2 and B4.
7	Leadership & Management	Provide technical leadership to their assigned team. Manage the team effectively and ethically through planning, allocation and reporting of work.	Successful delivery of team objectives.	S2, S4, S5, S6, B1 and B4.
8	Project Management	Complete engineering activities to budget and schedule; provide management and oversight of the lower-level engineering work packages.	Activities delivered in line with agreed time/cost/performance parameters.	B1 and B3.
9	Continuous Improvement	Actively contribute to a culture of best practice sharing, knowledge exploitation and process improvement in order to develop longer-term capability and expertise within the Electronic Systems function and across the wider engineering discipline.	Quality of and quantity of ideas and proposals for improvements are in line with expectations.	K1, B1, B2, B3 and B4.
10	Mentoring	Provide technical guidance and mentoring to less experienced engineers.	Successful Development of team and individual capability and performance	S5, S6 and B4.

KNOWLEDGE.

- K1. Demonstrate theoretical knowledge and a comprehensive understanding of advanced concepts in specialist areas of electronic engineering such as Microelectronics Systems Design, Embedded Systems, Micro and Nano Technologies, Photonic Technologies, and Wireless Communications.**
- K2. Demonstrate the application of theoretic knowledge to analyse complex problems in both existing and emerging electronic technologies to deliver innovative engineering solutions.**
- K3. Demonstrate knowledge of state of the art techniques and tools used in the design, realisation, verification and testing of Electronic Systems.**

SKILLS.

- S1. Analyse problems both systematically and creatively to determine appropriate methods of design, testing and evaluation.**
- S2. Manage implementation of Electronics systems design solutions and evaluate their effectiveness.**
- S3. Apply knowledge to successfully deliver innovative products and services and/or take technical responsibility for complex engineering systems.**
- S4. Take technical responsibility for projects involving complex Electronic Systems.**
- S5. Demonstrate effective interpersonal skills in communicating technical matters.**
- S6. Manage teams and develop staff to meet changing technical and business needs.**

BEHAVIOURS.

- B1. Accountable for project, finance and personnel management and managing trade-offs between technical and non-technical factors.**
- B2. Demonstrate effective written and verbal communications through reporting, presenting and discussing proposals, influencing and negotiating.**
- B3. Make a key contribution to their business's success, through innovation/creativity/change.**
- B4. Comply with relevant Codes of Conduct and exercise responsibilities in a safe, secure and ethical manner.**