ELECTRONIC SYSTEMS PRINCIPAL ENGINEER

Reference Number: ST0681

Details of standard

Occupation summary

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, Artificial Intelligence and the manufacturing industries. The broad purpose of the occupation is technical engineering leadership of complex Electronic Systems projects from conception through the whole design-implement-operation life cycle to obsolescence. They initiate and lead technical change, deliver innovative solutions, direct resources, manage teams 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 their organisation. Externally they would include customers, suppliers, academia, certification organisations, professional bodies, trade associations and regulatory authorities. Typically, they work in an office environment but they could also work in a manufacturing or test facility and at customer sites. An employee in this occupation will be responsible for making important engineering decisions relating to Electronics Systems, mitigating technical risk and controlling engineering resources. The Electronic Systems Principal Engineer operates with considerable autonomy, as an acknowledged expert and will most likely have experience across all project lifecycle phases. They are fully accountable to senior executives, depending upon the size of the organisation, for schedule, budget and personnel management aspects of significant projects and for managing trade-offs between technical and other factors. They are responsible for ensuring complex technical solutions are robust, innovative and in line with customer expectations. They may hold formal delegated authority for engineering decisions within their organisation. They are concerned with the development of other engineering and technical staff involved with Electronic Systems.

Entry requirements

The Standard is designed for post-graduate engineers. Typically, the minimum academic entry qualification required will be a Bachelor’s degree (BEng or BSc) at 2:2 Hons standard in Electronic Engineering or a closely related discipline, or equivalent. Employers will set their own entry requirements in terms of experience.

Occupation duties

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<td>Duty 1 Use scientific methodology</td>
<td>Quality of projects to time and cost</td>
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to apply understanding and knowledge in order to deliver Electronic Systems projects that meet customer requirements.

**Duty 2** Keep abreast of advances in technology, developments in the Electronics sector and new regulatory and compliance requirements.

Solutions reflect technological advances and are compliant with regulations.

**Duty 3** Translate customer aims and objectives into requirements, clear specifications and Electronic Systems design solutions.

Technical solutions meet specifications and are to customer satisfaction.

**Duty 4** Undertake critical evaluation and creatively produce innovative engineering solutions for Electronic Systems

Quality of technical solutions to time and cost constraints.

**Duty 5** Participate in technical “what if” scenario discussions and use systems thinking to make engineering decisions within own sphere of responsibility for Electronic Systems and delegated authority.

Outcome of technical discussions produce effective solutions.

**Duty 6** Chair technical meetings including design reviews for Electronic Systems.

Meetings and design reviews achieve objectives.

**Duty 7** Identify, analyse and understand technical risks in order to mitigate them and to ensure positive risk outcomes for all stakeholders.

Risks are managed appropriately and in line with company policy.

**Duty 8** Provide technical leadership and manage their team to ensure Electronic Systems work is undertaken safely, sustainably and ethically.

Successful delivery of team objectives.
Duty 9 Plan tasks and manage resources effectively to ensure that engineering activities and Electronic Systems projects are completed efficiently and, as far as possible, within budget and schedule.

Activities delivered in line with agreed time/cost/performance parameters.

K3, K5
S4, S5, S7
B1, B4, B6

Duty 10 Actively contribute to a culture of best practice knowledge sharing and exploitation 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.

K1, K3, K5
S3, S6
B3, B4, B6

Duty 11 Act as a role model and undertake continuing professional development.

Evidence of self-development though CPD and other learning activities.

K4, K6
S6, S7, S9
B2, B3, B4, B5, B6

Duty 12 Provide technical and behavioural guidance to mentor and develop less experienced engineering colleagues.

Successful development of individual and team capability and performance.

K1, K4, K5
S6, S7, S8
B4, B5

KSBs

Knowledge


K2 How to apply theoretic understanding to analyse complex problems in both existing and emerging Electronic technologies to deliver innovative engineering solutions.

K3 State of the art techniques, tools and methodologies used in the design, realisation, verification and testing of Electronic Systems.

K4 Regulatory and compliance frameworks, international standards, codes of practice and protocols relevant to Electronic Systems.
K5 Wider socio-economic factors, organisational context and wider business environment.

K6 Legal and commercial aspects relating to Electronic Systems, for instance Intellectual Property and patents.

Skills
S1 Evaluate complex technical information relating to Electronics to draw rational conclusions and to make informed engineering decisions.

S2 Apply systems thinking and methodology to problem solving in Electronics.

S3 Assess impact of external changes and technological developments in Electronics.

S4 Organise and plan engineering projects and tasks within agreed constraints and quality standards.

S5 Manage budgets and control technical resources.

S6 Communicate effectively and professionally with all levels;

S7 Develop and maintain effective working relationships and is able to interact and influence a range of internal and external stakeholders.

S8 Lead teams and manage staff.

S9 Apply effective time management techniques and be able to multi-task whilst meeting deadlines.

Behaviours
B1 Self-motivated and is able to work independently.

B2 Able to take responsibility for their actions, demonstrates resilience and acts with integrity.

B3 Be a reflective engineering practitioner, who is committed to their own personal learning and professional development.

B4 Works collaboratively; an enabler who willingly shares knowledge and experience.

B5 Promotes diversity, inclusion and equality.

B6 Complies with relevant Codes of Conduct and exercises responsibilities in a safe, sustainable and ethical manner.

Qualifications

English and Maths qualifications
Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Professional recognition
Engineering Council and the IET - Chartered Engineer Level
Occupational Level:
7

Duration (months):
36

Review
This standard will be reviewed after three years.

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