DRAFT END-POINT ASSESSMENT PLAN FOR THE HUMAN FACTORS SPECIALIST APPRENTICESHIP STANDARD

APPRENTICESHIP STANDARD REFERENCE NUMBER | LEVEL OF THIS END-POINT ASSESSMENT (EPA) | INTEGRATED
--- | --- | ---
ST0785 | 7 | Yes

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15. Value for money
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Introduction and overview

This document explains the requirements for end-point assessment (EPA) for the human factors specialist apprentices. End-point assessment organisations (EPAOs) must follow this when designing and delivering their EPA.

Human factors specialist apprentices, their employers and training providers should read this document.

An approved EPAO must conduct the EPA for this apprenticeship. Employers must select an approved EPAO from the Education and Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

A full-time apprentice typically spends 36 months on-programme (this means in training before the gateway) working towards competence as a human factors specialist. All apprentices must spend at least 12 months on-programme. All apprentices must spend at least 20% of their on-programme time completing off-the-job training.

This EPA has 2 EPA methods.

The grades available for each EPA method are:

EPA method 1 - project with project report, presentation and questions:
- fail
- pass
- distinction

EPA method 2 - professional discussion underpinned by a portfolio:
- fail
- pass
- distinction

The result from each EPA method is combined to decide the overall apprenticeship grade. The following grades are available for the apprenticeship:
- fail
- pass
- distinction

EPA summary table
| On-programme (typically 36 months) | Training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard.  
Training towards English and mathematics qualifications at Level 2¹, if required.  
Training towards any other qualifications listed in the occupational standard.  
The qualification(s) required are:  
Completed and passed all credit carrying modules of the Masters degree in Human Factors apart from the final module which will form the EPA  
Compiling a portfolio of evidence. |
|---|---|
| End-point assessment gateway | The employer must be content that the apprentice is working at or above the level of the occupational standard.  
The apprentice’s employer must confirm that they think the apprentice:  
- is working at or above the occupational standard as a human factors specialist  
- has the evidence required to pass the gateway and is ready to take the EPA  
An apprentice must have passed any other qualifications listed in the human factors specialist occupational standard ST0785.  
The qualification(s) required are:  
Completed and passed all credit carrying modules of the Masters degree in Human Factors apart from the final module which will form the EPA  
Apprentices must have achieved English and mathematics at Level 2¹.  
An apprentice must submit all gateway evidence to the EPAO. The EPAO must review the evidence. When the EPAO confirms the gateway requirements have been met, the EPA period starts and typically takes 6 months to complete. The expectation is that the EPAO will confirm the gateway requirements have been met. |
<table>
<thead>
<tr>
<th>End-point assessment (typically 6 months)</th>
<th>For the professional discussion underpinned by a portfolio, the apprentice will be required to submit a portfolio of evidence. Apprentices must submit any policies and procedures as requested by the EPAO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades available for each method:</td>
<td></td>
</tr>
</tbody>
</table>
| Project with project report, presentation and questions | - fail  
- pass  
- distinction |
| Professional discussion underpinned by a portfolio | - fail  
- pass  
- distinction |
| Overall EPA and apprenticeship can be graded: | - fail  
- pass  
- distinction |
| Professional recognition | This apprenticeship standard aligns with Graduate Member for Chartered Institute of Ergonomics and Human Factors (CIEHF). The experience gained and responsibility held by the apprentice on completion of the apprenticeship will either wholly or partially satisfy the requirements for registration at this level. |
| Re-sits and re-takes | - Re-take and re-sit grade cap: pass  
- Re-sit timeframe: typically 2 month(s)  
- Re-take timeframe: typically 4 month(s) |

\(^1\)For those with an education, health and care plan or a legacy statement, the apprenticeship’s English and mathematics minimum requirement is Entry Level 3. British Sign
Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

**Length of end-point assessment period**

The EPA will be taken within the EPA period. The EPA period begins when the EPAO confirms the gateway requirements are met and is typically 6 months.

The expectation is that the EPAO will confirm the gateway requirements are met and the EPA begins as quickly as possible.

**EPA gateway**

The apprentice’s employer must confirm that they think the apprentice is working at or above the occupational standard as a human factors specialist. They will then enter the gateway. The employer may take advice from the apprentice's training provider(s), but the employer must make the decision.

Apprentices must meet the following gateway requirements before starting their EPA.

These are:

- achieved English and mathematics at Level 2.
- Completed and passed all credit carrying modules of the Masters degree in Human Factors apart from the final module which will form the EPA
- for the professional discussion underpinned by a portfolio apprentices must submit: portfolio of evidence

**Portfolio of evidence requirements:**

Apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship. It should contain evidence related to the KSBs that will be assessed by this assessment method. The portfolio of evidence will typically contain 10 discrete pieces of evidence. Evidence should be mapped against the KSBs.

Evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested. Evidence sources may include:

- workplace documentation/records, for example:
  - workplace policies/procedures, records
  - witness statements
  - annotated photographs
  - video clips (maximum total duration 5 minutes); the apprentice must be in view and identifiable

This is not a definitive list; other evidence sources can be included.
The portfolio should not include reflective accounts or any methods of self-assessment. Any employer contributions should focus on direct observation of performance (for example witness statements) rather than opinions. The evidence provided should be valid and attributable to the apprentice; the portfolio of evidence should contain a statement from the employer and apprentice confirming this.

The EPAO should not assess the portfolio of evidence directly as it underpins the discussion. Independent assessors should review the portfolio of evidence prepare questions for the discussion assessment method. They are not required to provide feedback after this review.

Apprentices must submit any policies and procedures as requested by the EPAO.

The EPA period starts when the EPAO confirms all gateway requirements have been met. The expectation is they will do this as quickly as possible.

**Assessment methods**

The assessment methods can be delivered in any order.

The result of one assessment method does not need to be known before starting the next.

**Project with project report, presentation and questions**

**Overview**

A project involves the apprentice completing a significant and defined piece of work that has a real business application and benefit. The project must start after the apprentice has gone through the gateway.

The **project with project report, presentation and questions** must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this EPA method to the highest available grade.

The project must meet the needs of the employer’s business and be relevant to the apprentice’s occupation and apprenticeship. The EPAO must confirm that it provides the apprentice with the opportunity to demonstrate the KSBs mapped to this EPA method to the highest available grade. The EPAO must refer to the grading descriptors to ensure that projects are pitched appropriately.

This EPA method includes 2 components:

- **a project with a project output**
- **a presentation with questions and answers**

The project and any components must be assessed holistically by the independent assessor when they are deciding the grade for this EPA method.

**Rationale**
This EPA method is being used because it replicates the project-based approach adopted in the workplace. This method can evidence a broad range of knowledge and skills. The occupation requires individuals to produce and present project work on a frequent basis.

**Component 1: Project with a project output**

**Delivery**

Apprentices must complete a project which may be based on any of the following:

- a specific problem
- a recurring issue
- an idea or opportunity.

The project may also be based on: the application of a Human Centered Design (HCD) process to include the development or evaluation and improvement of a product, system or organisation. The application of the HCD process could occur at any point in the lifecycle from developing design concepts through to evaluating in-service equipment, systems or processes. For example, the project could be based upon:

- design, development and assessment of a prototype User Interface for a ship command and control system or medical device
- evaluation of an extant power plant or rail control room and development and assessment of recommendations for equipment, organisational and process improvements
- evaluation and iteration of a vehicle design using Computer Aided Design tools and/or physical prototypes to ensure physical accommodation of the intended user group

In line with a HCD process the project should be underpinned by appropriate Human Factors principles, analysis and methodologies to:

- identify and understand the context of use including the intended users, tasks and environments.
- identify user needs and specify user requirements for the product, system or organisation
- develop design solutions or recommendations for design improvement
- conduct Human Centred evaluation of design solutions with quantitative and/or qualitative methods
- engage with users to inform each stage of the HCD process

To ensure the project allows the apprentice to meet the KSBs mapped to this EPA method to the highest available grade, the EPAO should sign-off the project's title and scope at the gateway to confirm it is suitable.

The project output must be in the form of a report.

The apprentice must start the project after the gateway. They must complete and submit the report to the EPAO within 20 weeks post gateway. The employer should ensure the apprentice has the time and resources within this period, to plan and complete their project. The apprentice must complete their project and the production of all its components unaided.
The apprentice may work as part of a team which could include technical internal or external support. However, the project output must be the apprentice’s own work and will be reflective of their own role and contribution. The apprentice and their employer must confirm that the project output(s) is the apprentice’s own work when it is submitted.

The report must include at least:

- the project aims and objectives
- the project plan
- a description of the processes and methods applied
- a description of the outputs of each project phase including rationale and results of any analysis, design or evaluation activities performed
- a conclusion and discussion of project outcomes and recommendations

The project report has a word limit of 10000 words with a tolerance of 10% above or below this limit at the apprentice’s discretion. Appendices, references and diagrams are not included in this total. The project report must map, in an appendix, how it evidences the relevant KSBs mapped to this EPA method.

**Component 2: Presentation with questioning**

**Delivery**

This is a formal presentation where an apprentice will present to an independent assessor on a set subject. The independent assessor must ask questions. Apprentices must prepare, submit and deliver a presentation. The presentation is restricted to the KSBs allocated to this EPA method as shown in the mapping section of this document.

The presentation and questioning must last 60 minutes. This will typically include a presentation of 35 minutes and questioning lasting 25 minutes.

The independent assessor must ask at least 5 questions. They must use the questions from the EPAO’s question bank or create their own questions in-line with the EPAO’s training. Follow up questions are allowed where clarification is required.

The presentation will provide an overview of the apprentice’s project and the project report. Independent assessors will ask questions after the presentation. All presentations must include at least:

- an overview of the project
- the project scope (including key performance indicators)
- summary of actions undertaken by the apprentice
- project outcomes and how these were achieved.

The apprentice must prepare and submit their presentation to the EPAO at the same time as the report which is within 20 weeks post gateway.

The apprentice must notify the EPAO, at the submission of the presentation, of any technical requirements for the presentation. For the presentation, the apprentice will have access to:
The independent assessor must have at least 2 weeks to review the project output(s) and presentation before the presentation is delivered by the apprentice, to allow them to prepare appropriate questions.

Apprentices must be given at least 2 week(s) notice of the date and time of the presentation or question and answer session.

**Assessment location**

The presentation with questioning must take place in a suitable venue selected by the EPAO for example the EPAO’s or employer’s premises. The presentation with questioning should take place in a quiet room, free from distractions and influence.

The presentation with questioning can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

**Question and resource development**

EPAOs must write an assessment specification and question bank. The specification must be relevant to the occupation and demonstrate how to assess the KSBs shown in the mapping. It is recommended this is done in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of EPA materials when consulting employers. The questions must be unpredictable. A question bank of sufficient size will support this. The assessment specification and questions must be reviewed at least once a year to ensure they remain fit-for-purpose.

EPAOs must develop purpose-built question banks and ensure that appropriate quality assurance procedures are in place, for example, considering standardisation, training and moderation. EPAOs must ensure that questions are refined and developed to a high standard.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits or re-takes.

- independent assessor EPA materials which include:
  - training materials
  - administration materials
  - moderation and standardisation materials
  - guidance materials
  - grading guidance
  - question bank
- EPA guidance for the apprentice and employer
Professional discussion underpinned by a portfolio

Overview

In the professional discussion, an independent assessor and apprentice have a formal two-way conversation. It gives the apprentice the opportunity to demonstrate their competency across the KSBs as shown in the mapping.

Rationale

This EPA method is being used because it can synoptically assess knowledge, skills and behaviours. This method also helps to assess their in-depth understanding of their work and covers aspects of the occupation that are difficult to observe and take place in restricted and confidential settings. This is a consistent method that applies across work settings in the industry. It is reflective of industry best practice for reporting orally on work and justifying decisions taken. It also replicates the approach taken to reviewing candidate performance used in industry. Furthermore:

- it allows the apprentice to be assessed against KSBs that do not naturally occur in the project
- it allows assessment of some KSBs which may not naturally occur in every workplace or may take too long to observe to be assessed

Delivery

The professional discussion must be structured to give the apprentice the opportunity to demonstrate the KSBs mapped to this EPA method to the highest available grade.

to ensure the apprentice can evidence the KSBs assigned to the assessment method and to provide opportunity for them to show depth and breadth of coverage and, where they are able, to demonstrate the distinction criteria.

The themes of the professional discussion will cover the following:

- leadership and professional behaviours
- core technical knowledge
- human factors methodologies
- human factors practice

The EPAO must give an apprentice 2 weeks notice of the professional discussion. The independent assessor must have at least 2 week(s) to review the supporting documentation.

Apprentices must have access to their portfolio of evidence during the professional discussion.

Apprentices can refer to and illustrate their answers with evidence from their portfolio of evidence, however the portfolio of evidence is not directly assessed.

The professional discussion must last for 60 minutes. The independent assessor can increase the time of the professional discussion by up to 10%. This time is to allow the apprentice to
respond to a question if necessary.

For the professional discussion, the independent assessor must ask at least 8 questions. Follow-up questions are allowed. The independent assessor must use the questions from the EPAO's question bank or create their own questions in-line with the EPAO's training. The professional discussion must allow the apprentice the opportunity to demonstrate the KSBs mapped to this EPA method at the highest possible grade.

The independent assessor conducts and assesses the professional discussion.

The independent assessor must keep accurate records of the assessment. The records must include the KSBs met, the grade achieved and answers to questions.

The independent assessor will make all grading decisions.

Assessment location

The professional discussion must take place in a suitable venue selected by the EPAO (for example the EPAO's or employer's premises).

The professional discussion can be conducted by video conferencing. The EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided.

The professional discussion should take place in a quiet room, free from distractions and influence.

Question and resource development

EPAOs must write an assessment specification and question bank. The specification must be relevant to the occupation and demonstrate how to assess the KSBs shown in the mapping. It is recommended this is done in consultation with employers of this occupation. EPAOs should maintain the security and confidentiality of EPA materials when consulting employers. The questions must be unpredictable. A question bank of sufficient size will support this. The assessment specification and questions must be reviewed at least once a year to ensure they remain fit-for-purpose.

EPAOs must develop purpose-built question banks and ensure that appropriate quality assurance procedures are in place, for example, considering standardisation, training and moderation. EPAOs must ensure that questions are refined and developed to a high standard.

EPAOs must ensure that apprentices have a different set of questions in the case of re-sits or re-takes.

EPAOs must produce the following materials to support the professional discussion underpinned by a portfolio:

- independent assessor assessment materials which include:
  - training materials
  - administration materials
- moderation and standardisation materials
- guidance materials
- grading guidance
- question bank
- EPA guidance for the apprentice and employer

## Mapping of KSBs to grade themes

### Project with project report, presentation and questions - Project

<table>
<thead>
<tr>
<th>KSBS GROUPED BY THEME</th>
<th>KNOWLEDGE</th>
<th>SKILLS</th>
<th>BEHAVIOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project management K14 K16 S8 S13</td>
<td>Project management techniques for project delivery including planning, resource management, cost and budget control, risk, and quality. (K14) Time management techniques. (K16)</td>
<td>Plan, manage and lead projects. (S8) Plan and manage own time. (S13)</td>
<td>N/A</td>
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</tbody>
</table>

### Project with project report, presentation and questions - Project
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<tbody>
<tr>
<td>Human centred design application and process K11 K12 K19 S1 S10 S12 B2 B3 B5</td>
<td>Research design; ethical and environmental practice in research and qualitative and quantitative approaches to research. (K11) The principles and processes of Human Centred Design (K12) Inclusive and accessible design principles and practice. (K19)</td>
<td>Select and apply human factors methodologies to project requirements. (S1) Plan and undertake research to meet the project requirement. (S10) Use Human Factors design principles when developing solutions. (S12)</td>
<td>Act in a professional and ethical manner. (B2) Lead by example and act as an advocate for human centred and inclusive design practices. (B3) Lead by example to promote innovation and challenge existing practices. (B5)</td>
</tr>
</tbody>
</table>

**Project with project report, presentation and questions - Project**

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<tbody>
<tr>
<td>Critical analysis and assessment K2 S6</td>
<td>Numerical, analytical and critical analysis techniques for Human-System Analysis &amp; Assessment. The limitations of these techniques. (K2)</td>
<td>Collect, analyse and interpret data using numerical, analytical and critical analysis techniques. (S6)</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Professional discussion underpinned by a portfolio - Discussion**
<table>
<thead>
<tr>
<th>KSBS GROUPED BY THEME</th>
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<th>BEHAVIOUR</th>
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</thead>
<tbody>
<tr>
<td>Leadership and professional behaviours</td>
<td>Teamwork and leadership including negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations. (K15) Communication techniques including oral, written, and presentations. (K17) The implication of the broader business and engineering context including safety, environmental protection and sustainability, ethics, economic responsibility, social responsibilities, and advances in technology on human factors. (K18)</td>
<td>Communicate with colleagues and stakeholders in multidisciplinary teams using different methods including oral, written, and presentation. (S7) Teamwork and leadership skills including: negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations. (S15)</td>
<td>Adapt and is resilient to challenging or changing situations. (B1) Prioritise quality and continuous improvement practices. (B4) Collaborate and promote teamwork across disciplines. (B6) Commit to ongoing professional development. (B7)</td>
</tr>
</tbody>
</table>

Professional discussion underpinned by a portfolio - Discussion
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<thead>
<tr>
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<th>BEHAVIOUR</th>
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</thead>
<tbody>
<tr>
<td>Core technical knowledge K1 K5 K6 K7</td>
<td>The theoretical application of human sciences to the engineering and design of products, processes, and systems based on relevant parts of psychology, physiology, human biology, biomechanics and cognitive science. (K1) Human factors principles for Human Machine Interface (HMI) design. (K5) Capability and limitations in the design and evaluation of physical ergonomics. (K6) Robotic Intelligent and Autonomous Systems (RIAS) and their Human Factors considerations. (K7)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Professional discussion underpinned by a portfolio - Discussion**
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Human factors methodologies K3 K4 K8 K13 K20 S2 S3 S5 S9 S14</td>
<td>Qualitative and quantitative approaches and techniques for user engagement. (K3) Design principles including methods and limitations for systems design and sociotechnical system design. (K4) Principles of Human Factors Integration and Human System Integration. (K8) Product, service and system lifecycles: planning, developing, preparing, utilising and retirement. (K13) Techniques for user trials and experimentation appropriate to Human Factors design. (K20)</td>
<td>Use computer-based tools to assist in the design, analysis, evaluation and validation of jobs, interfaces, tasks and environments such as: Computer Aided Design, Task Analysis, Anthropometric Modelling, Workload Analysis, HCI/User Interface Design and Prototyping. (S2) Produce Specific-Measurable-Appropriate-Realistic-Timebound (SMART) requirements. (S3) Design and execute trials and experimentation involving Users. (S5) Produce documentation such as assessments, risk registers, plans, specifications and assurance cases. (S9) Integrate Human Factors programme of work within engineering programmes. (S14)</td>
<td>N/A</td>
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</tbody>
</table>
## Professional discussion underpinned by a portfolio - Discussion

<table>
<thead>
<tr>
<th>KSBS GROUPED BY THEME</th>
<th>KNOWLEDGE</th>
<th>SKILLS</th>
<th>BEHAVIOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human factors practice</td>
<td>National and international Human Factors standards and supporting guidance. (K9)</td>
<td>Identify and comply with legal, statutory and any other relevant legislation and standards to bound and inform design and engineering choices. (S4)</td>
<td>N/A</td>
</tr>
<tr>
<td>K9 K10 S4 S11</td>
<td>Legal requirements, including statutory and national, international and sector specific legislation and regulation. (K10)</td>
<td>Technical decision making related to Human factors engineering considering the impact on the project and area of delegated authority. (S11)</td>
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</table>

## Grading

**Project with project report, presentation and questions**

Fail - does not meet pass criteria
<table>
<thead>
<tr>
<th>THEME</th>
<th>PASS</th>
<th>DISTINCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KSBs</strong></td>
<td><strong>Apprentices must demonstrate all the pass descriptors</strong></td>
<td><strong>Apprentices must demonstrate all the pass descriptors and all of the distinction descriptors</strong></td>
</tr>
<tr>
<td><strong>Project management</strong>&lt;br&gt;K14 K16 S8 S13</td>
<td>Uses project and time management techniques to plan, manage and lead projects, including management of resources, risk and quality, and controlling cost and budgets in line with the project brief (K14, K16, S8, S13)</td>
<td>Critically analyses the impact on risk and quality outcomes of their selected project management techniques (K14, S8)</td>
</tr>
<tr>
<td><strong>Human centred design application and process</strong>&lt;br&gt;K11 K12 K19 S1 S10 S12 B2 B3 B5</td>
<td>Selects and applies human factors methodologies and design principles and processes to meet the project brief (K12, S1)&lt;br&gt;Leads by example to promote innovation and advocate human centred and inclusive design principles through developing accessible solutions which challenge existing practices in line with the project brief (K19, S12, B3, B5)&lt;br&gt;Plans and undertakes research, with qualitative and quantitative approaches, in line with project requirements and occupational guidelines for professional and ethical conduct (K11, S10, B2)</td>
<td>Uses multiple human factors methodologies in parallel or combination and reconciles their inconsistencies to deliver practical results, justifying the benefit and limitations of the different methodologies (K12, S1, S12, B3)&lt;br&gt;Evaluates the limitations of human factors research methodologies and findings and articulates how they apply to real-world problems (K11, S10)</td>
</tr>
<tr>
<td>Critical analysis and assessment</td>
<td>Collects, analyses and interprets data using numerical, analytical and critical analysis techniques to meet the project brief (K2, S6)</td>
<td>Critically evaluates the limitations of techniques used in the project to collect, analyse and interpret data (K2, S6)</td>
</tr>
</tbody>
</table>

**Professional discussion underpinned by a portfolio**

Fail - does not meet pass criteria
<table>
<thead>
<tr>
<th>THEME KSBs</th>
<th>PASS</th>
<th>DISTINCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership and professional behaviours K15 K17 K18 S7 S15 B1 B4 B6 B7</td>
<td>Apprentices must demonstrate all the pass descriptors</td>
<td>Apprentices must demonstrate all the pass descriptors and all of the distinction descriptors</td>
</tr>
<tr>
<td></td>
<td>Evaluates their choice of communication techniques for oral, written and formal presentations when dealing with technical and non-technical audiences such as colleagues and stakeholders in multidisciplinary teams (K17, S7)</td>
<td>Critically evaluates the impact of their teamwork and leadership skills on organisational or business outcomes (K15, S15)</td>
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<tr>
<td></td>
<td>Analyses their teamwork and leadership skills including negotiation techniques, conflict management development techniques and diversity, equality and inclusivity when collaborating and promoting teamwork across disciplines in line with organisational guidelines (K15, S15, B6)</td>
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<td></td>
<td>Evaluates their approach, adaptability and resilient to changing work tasks which gives priority to quality and continuous improvement practices in line with company policy (B1, B4)</td>
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<td></td>
<td>Evaluates the implications of human factors work in broader business and engineering contexts, including safety, ethics, environmental, sustainability, social inclusion, and advances in technology (K18)</td>
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<tr>
<td></td>
<td>Evaluates their commitment to professional development in line with organisational or professional body guidelines (B7)</td>
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</tr>
<tr>
<td>Core technical knowledge K1 K5 K6 K7</td>
<td>Summarises the theoretical applications of human sciences to the engineering and design of products processes and systems based on relevant links to</td>
<td></td>
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<tr>
<td>Human factors methodologies</td>
<td>Evaluates their use of computer-based tools in the design, analysis and validation of jobs, interfaces, tasks and environments within sociotechnical systems, including the impact and limitations they faced (K4, S2)</td>
<td>Critically evaluates the use of human factors and human system integration and articulates how they may be tailored for specific applications (K8, S14, S9, K13)</td>
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<td></td>
<td>Critically evaluates the process of Human Factors Integration and Human Systems Integration. Articulates how they integrate Human Factors into product, service and system lifecycles including producing documentation (K8, K13, S9, S14)</td>
<td>Critically evaluates the factors that impact the validity, reliability and applicability of user experiments or trials and how they can be addressed in experiment or trial design (K3, K20, S5)</td>
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<td></td>
<td>Justifies the production of Specific-Measurable-Appropriate-Realistic-Timebound (SMART) requirements to meet specified outcomes (S3)</td>
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<td></td>
<td>Evaluates how they use qualitative and quantitative approaches and techniques in the design and execution of user trials and experimentation (K3, K20, S5)</td>
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<tr>
<td></td>
<td>Articulates different human factors principles that would be used during Human Machine Interface Design (HMI) (K5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Articulates physical ergonomics principles including human capabilities and limitations, and their application to design (K6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Articulates the characteristics of Robotic Intelligent and Autonomous Systems (RIAS) and evaluates their Human Factors considerations (K7)</td>
<td></td>
</tr>
</tbody>
</table>
## Overall EPA grading

The EPA methods contribute equally to the overall EPA grade.

Performance in the EPA will determine the apprenticeship grade of:

- fail
- pass
- distinction

Independent assessors must individually grade the: **project with project report, presentation and questions and professional discussion underpinned by a portfolio** according to the requirements set out in this EPA plan.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA fail.

Apprentices must achieve at least a pass in all the EPA methods to get an overall pass. **In order to achieve an overall EPA ‘distinction’, apprentices must achieve a distinction in both assessment methods.**

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

<table>
<thead>
<tr>
<th>Human factors practice K9 K10 S4 S11</th>
<th>Analyses the impact of their technical decision making within their area of delegated authority and the impact of these decisions on engineering projects (S11)</th>
<th>Critically evaluates legal and statutory standards and guidance including the impact they have on design and engineering choices (K9, K10, S4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyses compliance with national and international legal, statutory, and regulatory standards and guidance which bound and inform design and engineering choices (K9, K10, S4)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Re-sits and re-takes

Apprentices who fail one or more EPA method(s) can take a re-sit or a re-take at the employer's discretion. The apprentice's employer needs to agree that a re-sit or re-take is appropriate. A re-sit does not need further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

The employer and EPAO agree the timescale for a re-sit or re-take. A re-sit is typically taken within 2 months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within 4 months of the EPA outcome notification.

If the apprentice fails the project assessment method, they will be required to amend the project output in line with the independent assessor’s feedback. The apprentice will be given 4 weeks to rework and submit the amended report.

Failed EPA methods must be re-sat or re-taken within a 6-month period from the EPA outcome notification, otherwise the entire EPA will need to be re-sat or re-taken in full.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

An apprentice will get a maximum EPA grade of pass for a re-sit or re-take, unless the EPAO determines there are exceptional circumstances.

### Roles and responsibilities
<table>
<thead>
<tr>
<th>ROLES</th>
<th>RESPONSIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apprentice</td>
<td>As a minimum, apprentices should:</td>
</tr>
<tr>
<td></td>
<td>• participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months</td>
</tr>
<tr>
<td></td>
<td>• undertake 20% off-the-job training as arranged by the employer and training provider</td>
</tr>
<tr>
<td></td>
<td>• understand the purpose and importance of EPA</td>
</tr>
<tr>
<td></td>
<td>• undertake the EPA including meeting all gateway requirements</td>
</tr>
<tr>
<td>Employer</td>
<td>As a minimum, employers must:</td>
</tr>
<tr>
<td></td>
<td>• select the EPAO and training provider</td>
</tr>
<tr>
<td></td>
<td>• work with the training provider (where applicable) to support the apprentice in the workplace and to provide the opportunities for the apprentice to develop the KSBs</td>
</tr>
<tr>
<td></td>
<td>• arrange and support a minimum of 20% off-the-job training to be undertaken by the apprentice</td>
</tr>
<tr>
<td></td>
<td>• decide when the apprentice is working at or above the level required by the occupational standard and so is ready for EPA</td>
</tr>
<tr>
<td></td>
<td>• ensure that all supporting evidence required at the gateway is submitted in accordance with this EPA plan</td>
</tr>
<tr>
<td></td>
<td>• remain independent from the delivery of the EPA</td>
</tr>
<tr>
<td></td>
<td>• confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer-specific documentation as required, for example company policies)</td>
</tr>
<tr>
<td></td>
<td>• ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the apprentice to meet the KSBs</td>
</tr>
<tr>
<td></td>
<td>• ensure the apprentice is well prepared for the EPA</td>
</tr>
<tr>
<td></td>
<td>• require the training provider and EPAO to ensure the EPA is booked in a timely manner</td>
</tr>
<tr>
<td></td>
<td>Post-gateway, employers must:</td>
</tr>
<tr>
<td></td>
<td>• confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer-specific documentation as required, for example company policies)</td>
</tr>
</tbody>
</table>
As a minimum, EPAOs must:

- access to any employer-specific documentation as required, for example company policies
- ensure that the EPA is scheduled with the EPAO for a date and time which allows appropriate opportunity for the KSBs to be met
- remain independent from the delivery of the EPA
- ensure the apprentice is given sufficient time away from regular duties to prepare for, and complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place
- where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a daily basis
- pass the certificate to the apprentice upon receipt from the EPAO
- conform to the requirements of this EPA plan and deliver its requirements in a timely manner
- conform to the requirements of the Register of End-Point Assessment Organisations (RoEPAO)
- conform to the requirements of the external quality assurance provider (EQAP) for this apprenticeship
- understand the occupational standard
- make all necessary contractual arrangements, including agreeing the price of the EPA
- develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material)
- appoint suitably qualified and competent independent assessors and oversee their working
- appoint administrators (and invigilators where required) to administer the EPA as appropriate
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA
Pre-gateway, EPAOs must:

- arrange for the EPA to take place, in consultation with the employer
- where the apprentice is not assessed in the workplace, ensure that the apprentice has access to the required resources and liaise with the employer to agree this if necessary
- develop and provide appropriate assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders
- have no direct connection with the apprentice, their employer or training provider. In all instances, including when the EPAO is the training provider (i.e. HEI), there must be no conflict of interest
- have policies and procedures for internal quality assurance (IQA), and maintain records of regular and robust IQA activity and moderation for external quality assurance (EQA) purposes
- deliver induction training for independent assessors, and for invigilators and/or markers (where used)
- undertake standardisation activity on this apprenticeship standard for all independent assessors before they conduct an EPA for the first time, if the EPA is updated and periodically as appropriate (a minimum of annually)
- manage invigilation of apprentices in order to maintain security of the assessment in line with the EPAO’s malpractice policy
- verify the identity of the apprentice being assessed
- use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard

Pre-gateway, EPAOs must:

- make all necessary contractual arrangements, including agreeing the price of the EPA
- provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA
- arrange for the EPA to take place, in consultation with the employer.

At the Gateway, EPAOs must:
**Independent assessor**

As a minimum, independent assessors must:

- have the competence to assess the apprentice at this level and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan
- understand the occupational standard and the requirements of this EPA
- have, maintain and be able to evidence, up-to-date knowledge and expertise of the subject matter
- deliver the end-point assessment in-line with the EPA plan
- comply with the IQA requirements of the EPAO
- have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances, including when the EPAO is the training provider (i.e. HEI)
- attend induction training
- attend standardisation events when they begin working for the EPAO, before they conduct an EPA for the first time and a minimum of annually on this apprenticeship standard
- assess each assessment method, as determined by the EPA plan, and without extending the EPA unnecessarily
- assess against the KSBs assigned to each assessment method, as shown in the mapping of assessment methods and as determined by the EPAO, and without extending the EPA unnecessarily
- make all grading decisions
- record and report all assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO, in a timely manner
- use language in the development and delivery of the EPA that is appropriate to the level of the occupational
### Reasonable adjustments

The EPAO must have reasonable adjustments arrangements for the EPA.

This should include:

- how an apprentice qualifies for reasonable adjustment
- what reasonable adjustments may be made

Adjustments must maintain the validity, reliability and integrity of the EPA as outlined in this EPA plan.

### Internal quality assurance (IQA)

Internal quality assurance refers to how EPAOs ensure valid, consistent and reliable EPA decisions. EPAOs must adhere to the requirements within the roles and responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent EPA regardless of employer, place, time or independent assessor
- appoint independent assessors who are competent to deliver the EPA and who:

<table>
<thead>
<tr>
<th>Training provider</th>
<th>As a minimum, training providers should:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the knowledge, skills and behaviours as listed in the occupational standard</td>
</tr>
<tr>
<td></td>
<td>• conduct training covering any knowledge, skill or behaviour requirement agreed as part of the Commitment Statement (often known as the Individual Learning Plan)</td>
</tr>
<tr>
<td></td>
<td>• monitor the apprentice’s progress during any training provider led on-programme learning</td>
</tr>
<tr>
<td></td>
<td>• advise the employer, upon request, on the apprentice’s readiness for EPA</td>
</tr>
<tr>
<td></td>
<td>• remain independent from the delivery of the EPA. Where the training provider is the EPAO (i.e. a HEI), there must be procurees in place to mitigate against any conflict of interest.</td>
</tr>
<tr>
<td></td>
<td>standard</td>
</tr>
<tr>
<td></td>
<td>• mark open (constructed) test answers accurately according to the EPAO’s mark scheme and procedures</td>
</tr>
</tbody>
</table>
• have recent relevant experience of the occupation or sector to at least occupational level 7 gained in the last 3 years or significant experience of the occupation or sector
• hold, or are working towards, an assessor qualification
• have professional body membership with:
  Individuals to be members of CIEHF
• meet the following minimum requirements:
  appropriate security clearance if required.
• operate induction training for anyone involved in the delivery and/or assessment of the EPA
• provide training for independent assessors in good assessment practice, operating the assessment tools and making grading decisions
• provide ongoing training for markers and invigilators
• provide standardisation activity for this apprenticeship standard for all independent assessors:
  • before they conduct an EPA for the first time
  • if the EPA is updated
  • periodically as appropriate (a minimum of annually)
• conduct effective moderation of EPA decisions and grades
• conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on EPA decisions and grades
• have no direct connection with the apprentice, their employer or training provider. In all instances, including when the EPAO is the training provider (for example a higher education institution)

Value for money
Affordability of the EPA will be aided by using at least some of the following:
• utilising digital remote platforms to conduct applicable assessment methods
• using the employer's premises
• conducting assessment methods on the same day

Professional recognition
This apprenticeship standard is designed to prepare successful apprentices to meet the requirements for registration as a:

Chartered Institute of Ergonomics and Human Factors (CIEHF) with Graduate Member
Mapping of KSBs to assessment methods
<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>ASSESSMENT METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K1</strong></td>
<td>The theoretical application of human sciences to the engineering and design of products, processes, and systems based on relevant parts of psychology, physiology, human biology, biomechanics and cognitive science.</td>
</tr>
<tr>
<td><strong>K2</strong></td>
<td>Numerical, analytical and critical analysis techniques for Human-System Analysis &amp; Assessment. The limitations of these techniques.</td>
</tr>
<tr>
<td><strong>K3</strong></td>
<td>Qualitative and quantitative approaches and techniques for user engagement.</td>
</tr>
<tr>
<td><strong>K4</strong></td>
<td>Design principles including methods and limitations for systems design and sociotechnical system design.</td>
</tr>
<tr>
<td><strong>K5</strong></td>
<td>Human factors principles for Human Machine Interface (HMI) design.</td>
</tr>
<tr>
<td><strong>K6</strong></td>
<td>Capability and limitations in the design and evaluation of physical ergonomics.</td>
</tr>
<tr>
<td><strong>K7</strong></td>
<td>Robotic Intelligent and Autonomous Systems (RIAS) and their Human Factors considerations.</td>
</tr>
<tr>
<td><strong>K8</strong></td>
<td>Principles of Human Factors Integration and Human System Integration.</td>
</tr>
<tr>
<td><strong>K9</strong></td>
<td>National and international Human Factors standards and supporting guidance.</td>
</tr>
<tr>
<td><strong>K10</strong></td>
<td>Legal requirements, including statutory and national, international and sector specific legislation and regulation.</td>
</tr>
<tr>
<td>K11</td>
<td>Research design; ethical and environmental practice in research and qualitative and quantitative approaches to research.</td>
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<tr>
<td>K12</td>
<td>The principles and processes of Human Centred Design</td>
</tr>
<tr>
<td>K13</td>
<td>Product, service and system lifecycles: planning, developing, preparing, utilising and retirement.</td>
</tr>
<tr>
<td>K14</td>
<td>Project management techniques for project delivery including planning, resource management, cost and budget control, risk, and quality.</td>
</tr>
<tr>
<td>K15</td>
<td>Teamwork and leadership including negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations.</td>
</tr>
<tr>
<td>K16</td>
<td>Time management techniques.</td>
</tr>
<tr>
<td>K17</td>
<td>Communication techniques including oral, written, and presentations.</td>
</tr>
<tr>
<td>K18</td>
<td>The implication of the broader business and engineering context including safety, environmental protection and sustainability, ethics, economic responsibility, social responsibilities, and advances in technology on human factors.</td>
</tr>
<tr>
<td>K19</td>
<td>Inclusive and accessible design principles and practice.</td>
</tr>
<tr>
<td>K20</td>
<td>Techniques for user trials and experimentation appropriate to Human Factors design.</td>
</tr>
<tr>
<td>SKILL</td>
<td>ASSESSMENT METHODS</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td><strong>S1</strong></td>
<td>Select and apply human factors methodologies to project requirements. Project with project report, presentation and questions</td>
</tr>
<tr>
<td><strong>S2</strong></td>
<td>Use computer-based tools to assist in the design, analysis, evaluation and validation of jobs, interfaces, tasks and environments such as: Computer Aided Design, Task Analysis, Anthropometric Modelling, Workload Analysis, HCI/User Interface Design and Prototyping. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S3</strong></td>
<td>Produce Specific-Measurable-Appropriate-Realistic-Timebound (SMART) requirements. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S4</strong></td>
<td>Identify and comply with legal, statutory and any other relevant legislation and standards to bound and inform design and engineering choices. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S5</strong></td>
<td>Design and execute trials and experimentation involving Users. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S6</strong></td>
<td>Collect, analyse and interpret data using numerical, analytical and critical analysis techniques. Project with project report, presentation and questions</td>
</tr>
<tr>
<td><strong>S7</strong></td>
<td>Communicate with colleagues and stakeholders in multidisciplinary teams using different methods including oral, written, and presentation. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S8</strong></td>
<td>Plan, manage and lead projects. Project with project report, presentation and questions</td>
</tr>
<tr>
<td><strong>S9</strong></td>
<td>Produce documentation such as assessments, risk registers, plans, specifications and assurance cases. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td><strong>S10</strong></td>
<td>Plan and undertake research to meet the project requirement. Project with project report, presentation and</td>
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</tr>
<tr>
<td><strong>S11</strong></td>
<td>Technical decision making related to Human factors engineering considering the impact on the project and area of delegated authority.</td>
</tr>
<tr>
<td><strong>S12</strong></td>
<td>Use Human Factors design principles when developing solutions.</td>
</tr>
<tr>
<td><strong>S13</strong></td>
<td>Plan and manage own time.</td>
</tr>
<tr>
<td><strong>S14</strong></td>
<td>Integrate Human Factors programme of work within engineering programmes.</td>
</tr>
<tr>
<td><strong>S15</strong></td>
<td>Teamwork and leadership skills including: negotiation techniques, conflict management, development techniques, and diversity, equality and inclusivity considerations.</td>
</tr>
<tr>
<td>BEHAVIOUR</td>
<td>ASSESSMENT METHODS</td>
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<tr>
<td>B1</td>
<td>Adapt and is resilient to challenging or changing situations. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td>B2</td>
<td>Act in a professional and ethical manner. Project with project report, presentation and questions</td>
</tr>
<tr>
<td>B3</td>
<td>Lead by example and act as an advocate for human centred and inclusive design practices. Project with project report, presentation and questions</td>
</tr>
<tr>
<td>B4</td>
<td>Prioritise quality and continuous improvement practices. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td>B5</td>
<td>Lead by example to promote innovation and challenge existing practices. Project with project report, presentation and questions</td>
</tr>
<tr>
<td>B6</td>
<td>Collaborate and promote teamwork across disciplines. Professional discussion underpinned by a portfolio</td>
</tr>
<tr>
<td>B7</td>
<td>Commit to ongoing professional development. Professional discussion underpinned by a portfolio</td>
</tr>
</tbody>
</table>