**Digital Apprenticeships at Gloucestershire College**

**Infrastructure Technician**



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## Introduction

This handbook contains specific information about the Infrastructure Technician apprenticeship.

See the general handbook for information common to all the digital apprenticeships.

An Infrastructure Technician provides support to internal and external customers, helping them to be productive when using technology to do their own jobs, by using tools to problem solve and trouble shoot non-routine problems. The Infrastructure Technician sets people up on systems and provides support when they need it, rectifying issues to maintain the organisations productivity.

Job roles include:

* Helpdesk Technician
* First or Second Line Support
* IT Infrastructure Technician
* Network Support

## Qualification

Level 3 Infrastructure Technician

## Entry Requirements

You will need five GCSEs at grades A to C or 4 to 9, (including English, Mathematics and a Technology subject); a relevant Level 2 Apprenticeship; other relevant qualifications and experience; or an aptitude test with a focus on IT skills.

## Duration

This apprenticeship will last 18 months in total and will be concluded by an end point assessment (EPA).

It consists of 80% on the job training and 20% of off the job training.

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| --- | --- |
| **On the job training and projects** | 80% |
| **College Day Release** | 10% |
| **Assignments/Portfolio** | 10% |
| **TOTAL** | 100% |

## What you will study at college

There are five BCS knowledge modules and industry certifications studied in the following order:

|  |
| --- |
| CompTIA A+ |
| Microsoft Install and configure Windows 10 |
| BCS Level 3 Award in Cloud Services |
| BCS Level 3 Award in Coding and Logic |
| ITIL Foundation |

You will be required to complete a module before commencing the next module. Each module has a BCS or professional qualification which needs to be completed by the apprentice. The modules are made up of:

* Technical Competencies
* Technical knowledge and Understanding
* Underpinning Skills, Attitudes and Behaviours

The BCS exams have a pass mark of 65%.

External tests will come in the form of automated tests. The tests offer instant results to the learner. We will provide sample tests on an ongoing basis.

All the topics for each module and industry certification are shown in Appendix 1.

## In the Workplace

You will be set projects by your employer and your assessor. These will allow you to show what you can do, the way in which you have done it and the relationships with your colleagues. You will build a portfolio of evidence leading to a final (summative) portfolio for external assessment.

All evidence for the portfolio will be submitted electronically to the college’s electronic assessment software (accessed by web browser)

The purpose of the portfolio is to demonstrate that you have attained all the knowledge and skills shown in this table:

|  |  |
| --- | --- |
| **Qualification Level 3 Descriptor** | |
| Knowledge descriptor (the holder…) | Has factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine. Can interpret and evaluate relevant information and ideas. Is aware of the nature of the area of study or work. Is aware of different perspectives or approaches within the area of study or work. |
| Skills descriptor (the holder can…) | Identify, select and use appropriate cognitive and practical skills, methods and procedures to address problems that while well- defined, may be complex and non-routine. Use appropriate investigation to inform actions. Review how effective methods and actions have been. |

Competency in the workplace, as evidenced by the portfolio, is divided into what you have done, the way in which you did it and with whom you worked. You need to meet the standards to gain a pass, but of you significantly exceed the standards you can be awarded a merit or a distinction. This is decided by the external assessor during end point assessment.

Details of the competency standards assessed in the portfolio are shown in appendix 2.

## Grading the summative portfolio

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| GRADE | The WHAT | | The HOW | | With WHOM | |
| What you have shown you can do | | The way in which you have done the work | | The personal and interpersonal qualities you brought to work relationships | |
| Met expectations | Significantly exceeded expectations | Met expectations | Significantly exceeded expectations | Met expectations | Significantly exceeded expectations |
| DISTINCTION |  |  |  |  |  |  |
| MERIT |  |  |  |  |  |  |
| MERIT |  |  |  |  |  |  |
| PASS |  |  |  |  |  |  |

## Progress Monitoring

You will regularly be visited by your appointed assessor (normally monthly). Both you and your line manager will be required so that new projects can be agreed

There will be a review of

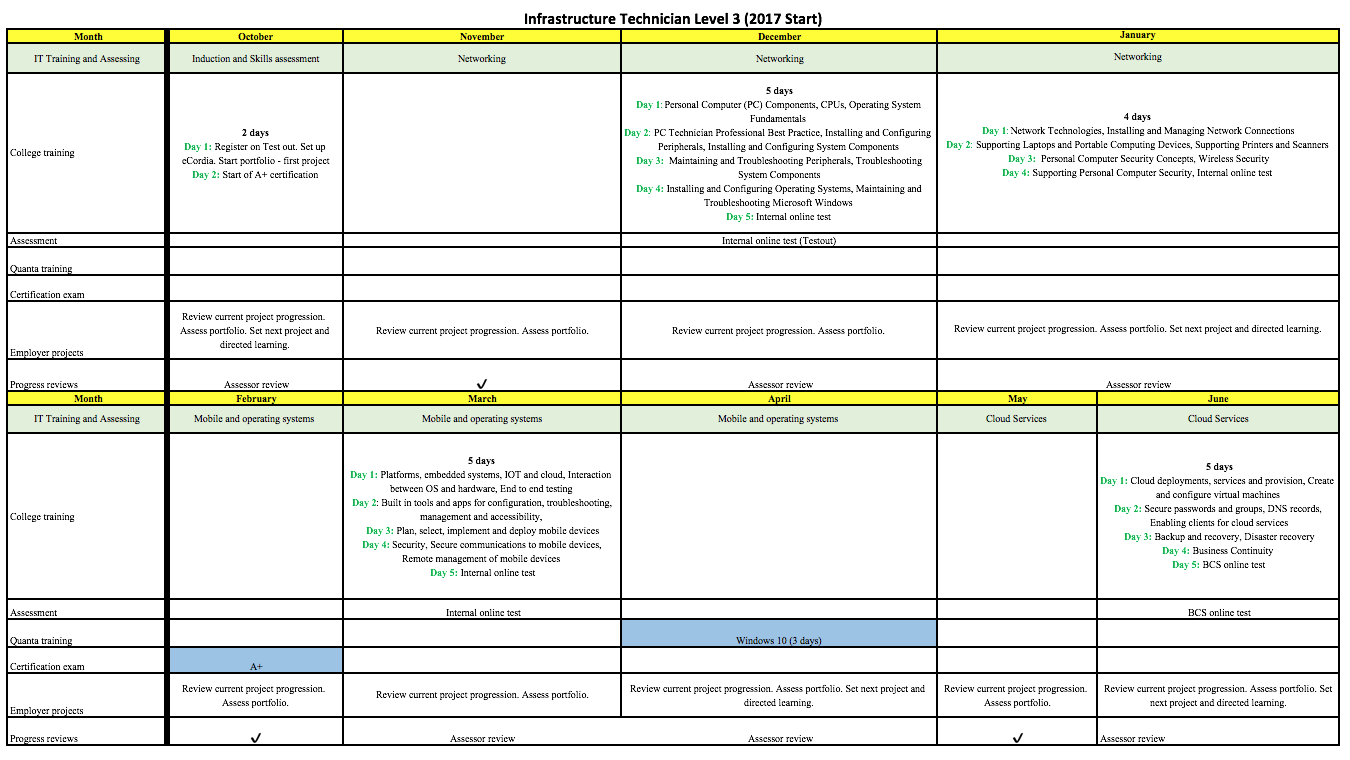
* your portfolio
* the record of assignment and portfolio time spent away from normal duties
* your progress against expectation
* the projects and tasks to be completed before the next visit
* the date and time of the next visit

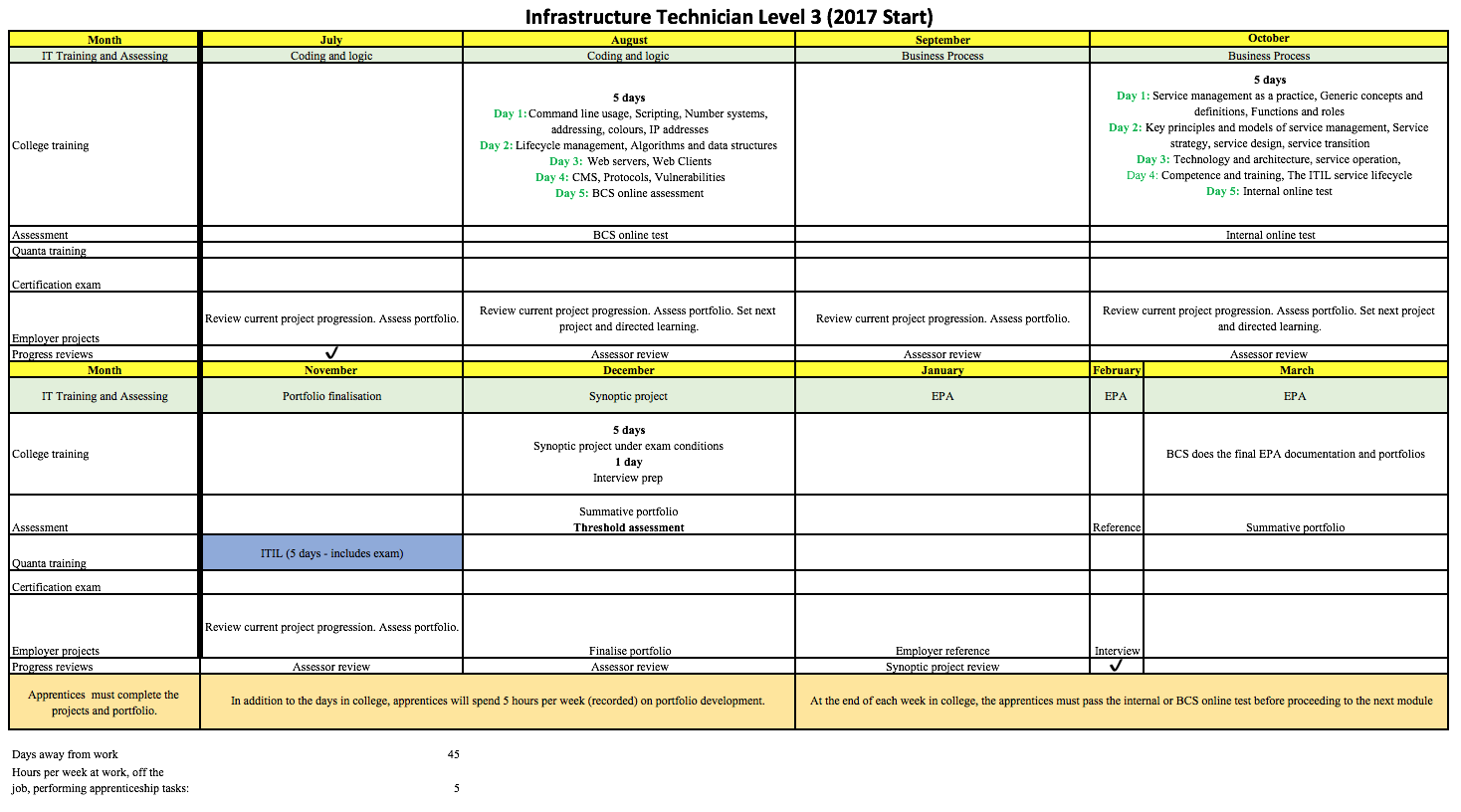
All progress will be monitored via the college’s electronic assessment software (accessed by web browser)

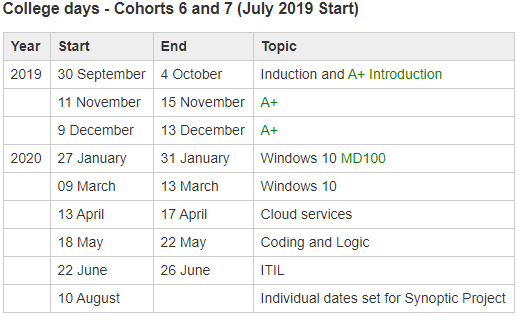
*The training coordinator will visit you regularly. At this meeting she will evaluate your overall performance, attendance, progress, etc.*

## Training plan

The table on the next page shows all the activities for the apprenticeship by month.







# Appendix 1: Infrastructure Technician Skills Audit

The items are from the BCS Knowledge Module (KM) and industry certification curricula. They cover all the topics you are required to know.

Tick the box in each column that most matches your knowledge and competence for that item.

means you do not know this topic

0 means you have some knowledge of the topic

means you are confident about this topic

|  |  |  |  |
| --- | --- | --- | --- |
| **A+** |  | **0** |  |
| PC Connection Methods |  |  |  |
| Create Network Connections |  |  |  |
| Tools of the Trade  Electrical Safety  Environmental Safety and Materials Handling |  |  |  |
| Diagnostics and Troubleshooting  Maintaining and Troubleshooting Peripherals   * Display Devices * Input Devices * Adapter Cards * Multimedia Devices   Troubleshooting System Components   * Storage Devices * Power Supplies * Memory * CPUs * System Boards   Maintain and Troubleshoot Laptops and Portable Devices |  |  |  |
| Preventative Maintenance, Professionalism and Communication |  |  |  |
| PC Components, System Unit Components, Storage Devices, Printer and Scanner Technologies, Printer and Scanner Components, Printer and Scanner Processes  Installing and Configuring Peripherals   * Display Devices * Input Devices * Adapter Cards * Multimedia Devices   Installing and Configuring System Components   * Storage Devices * Power Supplies * Memory   Laptop and Portable Computing Device Components |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Optimising Windows |  |  |  |
| Installing Microsoft Windows  Install and Configure Web Browsers  Upgrading Windows  Add Devices to Windows  Install and Configure Laptops and Portable Devices  Printer Installation and Configuration  Printer Maintenance and Troubleshooting |  |  |  |
| PC Operating Systems |  |  |  |
| Troubleshooting Windows  Recovering Windows  Windows User Interface Components  Windows File System Management  Windows System Management Tools  Maintain and Troubleshoot Network Connections  Operating System Utilities  Maintain Microsoft Windows |  |  |  |
| Network Concepts  Network Communications  Network Connectivity  Internet Technologies |  |  |  |
| Install and Configure Security Measures  Maintain and Troubleshoot Security Measures  Security Fundamentals  Security Protection Measures  Data and Physical Security  Wireless Security  Social Engineering |  |  |  |
| **Install and configure Windows 10** |  |  |  |
| Prepare for installation  Install Windows  Configure devices and device drivers  Perform post installation configuration  Implement Windows 10 in an enterprise environment |  |  |  |
| Configure networking  Configure storage  Configure data access and usage  Implement applications  Configure updates  Monitor Windows  Configure advanced management tools |  |  |  |
| Configure system and data recovery  Configure authorisation and authentication |  |  |  |
| Configure remote management |  |  |  |

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| **BCS KM3 Cloud services** |  |  |  |
| Cloud deployments, services and provision |  |  |  |
| Create and configure virtual machines |  |  |  |
| Secure passwords, groups |  |  |  |
| DNS records |  |  |  |
| Enabling clients for cloud services |  |  |  |
| Backup and recovery |  |  |  |
| Disaster recovery |  |  |  |
| Business continuity |  |  |  |
| **BCS KM4 Coding and logic** |  |  |  |
| Command line usage |  |  |  |
| Scripting |  |  |  |
| Number systems, addressing, colours, IP addresses |  |  |  |
| Lifecycle management |  |  |  |
| Algorithms and data structures |  |  |  |
| Web servers |  |  |  |
| Web clients |  |  |  |
| CMS |  |  |  |
| Protocols |  |  |  |
| Vulnerabilities |  |  |  |
| **ITIL Foundation** |  |  |  |
| Service management as a practice |  |  |  |
| Generic concepts and definitions |  |  |  |
| Functions and roles |  |  |  |
| Key principles and models of service management |  |  |  |
| Service strategy, service design, service transition, service operation |  |  |  |
| Technology and architecture |  |  |  |
| Competence and training |  |  |  |
| The ITIL service lifecycle |  |  |  |

# Appendix 2: Competency standards

## The what – what the apprentice has shown they can do

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| --- | --- |
| **Competency Standard** | **Minimum expected requirements** |
| **Communication**  Works both independently and as part of a team and following the organisations standards; competently demonstrating an ability to communicate both in writing and orally at all levels, using a range of tools and demonstrating strong interpersonal skills and cultural awareness when dealing with colleagues, customers and clients during all tasks. | The apprentice should be able to use a minimum of 3 tools to communicate   * Oral * Face-to-face * Remote * Diagrammatic   The apprentice should be able to demonstrate and compile three different forms of written professional correspondence.  The apprentice must be able to explain 3 types of communication styles to ensure cultural awareness and appropriateness for customers are taken into account. |
| **IT Security**  Demonstrates the necessary skills and behaviours to securely operate across all platforms and areas of responsibilities in line with organisational guidance, legislation | The apprentice must demonstrate how they comply with organisational security processes and how they would recognise and escalate issues.  The apprentice must be able to locate and follow policies and legislation |
| **Remote Infrastructure**  Effectively operates a range of mobile devices and securely add them to a network in accordance with organisations policies and procedures | The apprentice must demonstrate how to securely connect a minimum of two different types of devices (e.g. laptop/mobile) to access the organisation’s network services (e.g. email, files, applications) |
| **Data**  Effectively records, analyses and communicates data at the appropriate level using the organisation’s standard tools and processes and to all stakeholders within the responsibility of the position | The apprentice must be able to select and securely use three appropriate tools when working with and analysing data. |
| **Problem solving**  Applies structured techniques to common and non-routine problems, testing methodologies and troubleshooting and analyses problems by selecting the digital appropriate tools and techniques in line with organisation guidance and to obtain the relevant logistical support as required | The apprentice must be able to select and use three appropriate tools for testing, troubleshooting and analysing problems.  The apprentice must be able to demonstrate compliance with organisational guidance.  The apprentice should demonstrate processes and practices for obtaining logistical support. |
| **Workflow management**  Works flexibly and demonstrates the ability to work under pressure to progress allocated tasks in accordance with the organisation’s reporting and quality systems | The apprentice must be able to demonstrate the ability to prioritise workflow and manage allocated tasks. The apprentice must be able to record tasks and comply with organisations quality processes. |
| **Health and Safety**  Interprets and follows IT legislation to securely and professional work productively in the work environment  Understands and applies Health & Safety policies to every day work | The apprentice must be able to demonstrate their interpretation and secure working practices in accordance with IT legislation.  The apprentice must demonstrate an understanding and apply Health & Safety policies to every day work. |
| **Performance**  Optimises the performance of hardware, software and Network Systems and services in line with business requirements | The apprentice must be able to demonstrate how to configure a minimum of three pieces of hardware and configure three different types of software in line with business requirements. |
| Understands and responds to the correct processes associated with WEEE (the Waste Electrical and Electronic Equipment Directive) | The apprentice must be able to explain how to comply when required with WEEE and the implications of data protection during disposal. |

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| **Criteria for a merit or distinction** | |
| **Dimensions** | **Description of what significantly above the expected level of quality looks like** |
| **Breadth** – the range of tools and methods understood and applied | Understands and applies a wide range of tools and methods  Accurately and appropriately applies and effectively implements the right tools and methods in a variety of different situations |
| **Depth** – the level to which these  tools and methods are understood and applied | A capable user - exploits the functionality/capability of the tools and methods  Broad understanding of different tools and methods and how and why they can be applied in different contexts |
| **Complexity** – the extent and prevalence of inter-related and inter- dependant factors in the work and how well the apprentice has dealt with these | Deals confidently and capably with interrelated and interdependent factors in their work |

## The how: the way in which the work has been done

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| --- | --- |
| **Competency Standard** | **Minimum expected requirements** |
| Apprentices can demonstrate the full range of skills, knowledge and behaviours required to fulfil their job role | Knows what skills, knowledge and behaviours are needed to do the job well  Are aware of their own strengths in the job role, and any areas for improvement Appreciate who else is important, for them to do their job and fulfil the role effectively (e.g. colleagues, managers, other stakeholders)  Are aware of potential risks in the job role (e.g. security, privacy, regulatory) Use personal attributes effectively in the role Understand how the job fits into the organisation as a whole |

|  |  |
| --- | --- |
| Apprentices can demonstrate how they contribute to the wider business objectives and show an understanding of the wider business environments | Understands the goals, vision and values of the organisation Aware of the commercial objectives of the tasks/ projects they are working on Understands their role in meeting or exceeding customers’ requirements and expectations Is in tune with the organisation’s culture |
| Apprentices can demonstrate the ability to use both logical and creative thinking skills when undertaking work tasks, recognising and applying techniques from both. | Logical thinking   * Recognises the conclusion to be reached * Proceeds by rational steps * Evaluates information, judging its relevance and value * Supports conclusions, using reasoned arguments and evidence Creative thinking: * Explores ideas and possibilities * Makes connections between different aspects * Embraces ideas and approaches as conditions or circumstances change |
| Apprentices can show that they recognise problems inherent in, or emerging during, work tasks, and can tackle them effectively | Problem-solving:   * Analyses situations * Defines goals * Contributes to the development of solutions * Prioritises actions * Deals with unexpected occurrences |

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| --- | --- |
| **Criteria for a merit or distinction** | |
| **Dimensions** | **Description of what significantly above the expected level of quality looks like** |
| **Responsibility** – the scope of responsibility and level of accountability demonstrated in the apprentice’s work | Undertakes work that is more complex, more critical or more difficult  Works independently and takes responsibility |
| **Initiative** | Demonstrates an ability to extend or enhance their approach to work and the quality of outcomes  Doesn’t just solve the problem but explores all known options to do it better, more efficiently, more elegantly or to better meet customer needs |
| **Delivery focus** – the extent to which  the apprentice has shown they can grasp the problems, identify solutions and make them happen to meet client needs | Shows good project management skills, in defining problem, identifying solutions and making them happen  Demonstrates a disciplined approach to execution, harnessing resources effectively  Drives solutions – with a strong goal focused and appropriate level of urgency |

## The with whom: the personal and interpersonal qualities the apprentice has brought to internal and external relationships

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| **Competency Standard** | **Minimum expected requirements** |
| Apprentices can manage relationships with work colleagues, including those in more senior roles, customers/clients and other stakeholders, internal or external and as appropriate to their roles, so as to gain their confidence, keep them involved and maintain their support for the task/project in hand.    Apprentices can establish and maintain productive working relationships, and can use a range of different techniques for doing so. | Managing relationships:   * Understands the value and importance of good relationships * Acknowledges other people’s accomplishments and strengths * Understands how to deal with conflict * Promotes teamwork by participating Customer/client relationships: * Understands their requirements, including constraints and limiting factors * Sets reasonable expectations * Understands how to communicate with them in decisions and actions * Interacts positively with them * Provides a complete answer in response to queries (‘transparency’, ‘full disclosure’) Stakeholders: * Understands who they are and what their ‘stake’ is * Prioritises stakeholders in terms of their importance, power to affect the task and interest in it   Agrees objectives |
| Apprentices can communicate effectively with a range of people at work, one-to-one and in groups, in different situations and using a variety of methods.    Apprentices can demonstrate various methods of communication, with an understanding of the strengths, weaknesses and limitations of these, the factors that may disrupt it, and the importance of checking other people’s understanding. | Intention/purpose:   * Understands the purpose of communicating in a particular situation or circumstance (e.g. inform, instruct, suggest, discuss, negotiate etc.) * Checks that the person/people with whom one is communicating also understand the purpose * Is sensitive to the dynamics of the situation * Is aware of anything that might disrupt the effectiveness of the communication (e.g. status, past history)   a. Method:   * Understands the most appropriate method for the situation * Aware of the limitations of the chosen method, and the possible risks of miscommunication (e.g. ambiguity) * Takes account of the affective dimensions of the method (e.g. body language, tone of voice, eye contact, facial expression etc.)   b. Execution:   * Expresses self clearly and succinctly, but not over-simplifying * Checks that the other person/people understand what is being expressed * Takes account of the potential barriers to understanding (e.g. filtering, selective perception, information overload) * Modifies the purpose and methods of communication during a situation in response to cues from the other person/people |
| **Criteria for a merit or distinction** | |
| **Dimensions** | **Description of what significantly above the expected level of quality looks like** |
| **Scope and appropriateness –** the range  of internal and external people and situations that the apprentice has engaged appropriately and effectively with | Internally – works alone, 1:1, in a team and with colleagues at all levels  Externally – works with customers, suppliers and partners in a variety of situations    Reads situations, adapts behaviours, and communicates appropriately for the situation and the audience |
| **Reliability** – the extent to which they perform and behave professionally | Can be trusted to deliver, perform and behave professionally, manages and delivers against expectations, proactively updates colleagues and |
| **A role model and exemplar to others** | Actively works with others and leads by example |