

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% off the job training.

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 if 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.

Infrastructure Technician Level 3 (2017 Start)

Month	October	November	December	January	
IT Training and Assessing	Induction and Skills assessment	Networking	Networking	Networking	
College training	<p>2 days</p> <p>Day 1: Register on Test out. Set up eCordia. Start portfolio - first project</p> <p>Day 2: Start of A+ certification</p>		<p>5 days</p> <p>Day 1: Personal Computer (PC) Components, CPUs, Operating System Fundamentals</p> <p>Day 2: PC Technician Professional Best Practice, Installing and Configuring Peripherals, Installing and Configuring System Components</p> <p>Day 3: Maintaining and Troubleshooting Peripherals, Troubleshooting System Components</p> <p>Day 4: Installing and Configuring Operating Systems, Maintaining and Troubleshooting Microsoft Windows</p> <p>Day 5: Internal online test</p>	<p>4 days</p> <p>Day 1: Network Technologies, Installing and Managing Network Connections</p> <p>Day 2: Supporting Laptops and Portable Computing Devices, Supporting Printers and Scanners</p> <p>Day 3: Personal Computer Security Concepts, Wireless Security</p> <p>Day 4: Supporting Personal Computer Security, Internal online test</p>	
Assessment			Internal online test (Testout)		
Quanta training					
Certification exam					
Employer projects	Review current project progression. Assess portfolio. Set next project and directed learning.	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio. Set next project and directed learning.	
Progress reviews	Assessor review	✓	Assessor review	Assessor review	
Month	February	March	April	May	June
IT Training and Assessing	Mobile and operating systems	Mobile and operating systems	Mobile and operating systems	Cloud Services	Cloud Services
College training		<p>5 days</p> <p>Day 1: Platforms, embedded systems, IOT and cloud, Interaction between OS and hardware, End to end testing</p> <p>Day 2: Built in tools and apps for configuration, troubleshooting, management and accessibility,</p> <p>Day 3: Plan, select, implement and deploy mobile devices</p> <p>Day 4: Security, Secure communications to mobile devices, Remote management of mobile devices</p> <p>Day 5: Internal online test</p>			<p>5 days</p> <p>Day 1: Cloud deployments, services and provision, Create and configure virtual machines</p> <p>Day 2: Secure passwords and groups, DNS records, Enabling clients for cloud services</p> <p>Day 3: Backup and recovery, Disaster recovery</p> <p>Day 4: Business Continuity</p> <p>Day 5: BCS online test</p>
Assessment		Internal online test			BCS online test
Quanta training			Windows 10 (3 days)		
Certification exam	A+				
Employer projects	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio. Set next project and directed learning.	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio. Set next project and directed learning.
Progress reviews	✓	Assessor review	Assessor review	✓	Assessor review

Infrastructure Technician Level 3 (2017 Start)

Month	July	August	September	October	
IT Training and Assessing	Coding and logic	Coding and logic	Business Process	Business Process	
College training		<p>5 days</p> <p>Day 1: Command line usage, Scripting, Number systems, addressing, colours, IP addresses</p> <p>Day 2: Lifecycle management, Algorithms and data structures</p> <p>Day 3: Web servers, Web Clients</p> <p>Day 4: CMS, Protocols, Vulnerabilities</p> <p>Day 5: BCS online assessment</p>		<p>5 days</p> <p>Day 1: Service management as a practice, Generic concepts and definitions, Functions and roles</p> <p>Day 2: Key principles and models of service management, Service strategy, service design, service transition</p> <p>Day 3: Technology and architecture, service operation.</p> <p>Day 4: Competence and training, The ITIL service lifecycle</p> <p>Day 5: Internal online test</p>	
Assessment		BCS online test		Internal online test	
Quanta training					
Certification exam					
Employer projects	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio. Set next project and directed learning.	Review current project progression. Assess portfolio.	Review current project progression. Assess portfolio. Set next project and directed learning.	
Progress reviews	✓	Assessor review	Assessor review	Assessor review	
Month	November	December	January	February	March
IT Training and Assessing	Portfolio finalisation	Synoptic project	EPA	EPA	EPA
College training		<p>5 days</p> <p>Synoptic project under exam conditions</p> <p>1 day</p> <p>Interview prep</p>			BCS does the final EPA documentation and portfolios
Assessment		Summative portfolio Threshold assessment		Reference	Summative portfolio
Quanta training	ITIL (5 days - includes exam)				
Certification exam					
Employer projects	Review current project progression. Assess portfolio.				
Progress reviews	Assessor review	Finalise portfolio Assessor review	Employer reference Synoptic project review	Interview ✓	
Apprentices must complete the projects and portfolio.	In addition to the days in college, apprentices will spend 5 hours per week (recorded) on portfolio development.		At the end of each week in college, the apprentices must pass the internal or BCS online test before proceeding to the next module		

Days away from work 45
 Hours per week at work, off the job, performing apprenticeship tasks: 5

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 <ul style="list-style-type: none"> • Display Devices • Input Devices • Adapter Cards • Multimedia Devices 			
Troubleshooting System Components <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • Display Devices • Input Devices • Adapter Cards • Multimedia Devices 			
Installing and Configuring System Components <ul style="list-style-type: none"> • 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			

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

Competency Standard	Minimum expected requirements
<p>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.</p>	<p>The apprentice should be able to use a minimum of 3 tools to communicate</p> <ul style="list-style-type: none"> • Oral • Face-to-face • Remote • Diagrammatic <p>The apprentice should be able to demonstrate and compile three different forms of written professional correspondence.</p> <p>The apprentice must be able to explain 3 types of communication styles to ensure cultural awareness and appropriateness for customers are taken into account.</p>
<p>IT Security Demonstrates the necessary skills and behaviours to securely operate across all platforms and areas of responsibilities in line with organisational guidance, legislation</p>	<p>The apprentice must demonstrate how they comply with organisational security processes and how they would recognise and escalate issues.</p> <p>The apprentice must be able to locate and follow policies and legislation</p>
<p>Remote Infrastructure Effectively operates a range of mobile devices and securely add them to a network in accordance with organisations policies and procedures</p>	<p>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)</p>
<p>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</p>	<p>The apprentice must be able to select and securely use three appropriate tools when working with and analysing data.</p>
<p>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</p>	<p>The apprentice must be able to select and use three appropriate tools for testing, troubleshooting and analysing problems.</p> <p>The apprentice must be able to demonstrate compliance with organisational guidance.</p> <p>The apprentice should demonstrate processes and practices for obtaining logistical support.</p>
<p>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</p>	<p>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.</p>
<p>Health and Safety</p>	<p>The apprentice must be able to demonstrate their interpretation and secure working practices in accordance with IT legislation.</p>

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 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.

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

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 <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Analyses situations • Defines goals • Contributes to the development of solutions <ul style="list-style-type: none"> • Prioritises actions • Deals with unexpected occurrences

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

Competency Standard	Minimum expected requirements
<p>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.</p> <p>Apprentices can establish and maintain productive working relationships, and can use a range of different techniques for doing so.</p>	<p>Managing relationships:</p> <ul style="list-style-type: none"> • 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 <p>Customer/client relationships:</p> <ul style="list-style-type: none"> • 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’) <p>Stakeholders:</p> <ul style="list-style-type: none"> • 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 <p>Agrees objectives</p>
<p>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.</p> <p>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.</p>	<p>Intention/purpose:</p> <ul style="list-style-type: none"> • 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) <p>a. Method:</p> <ul style="list-style-type: none"> • 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.)

	<p>b. Execution:</p> <ul style="list-style-type: none"> • 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	<p>Internally – works alone, 1:1, in a team and with colleagues at all levels</p> <p>Externally – works with customers, suppliers and partners in a variety of situations</p> <p>Reads situations, adapts behaviours, and communicates appropriately for the situation and the audience</p>
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