

Programme Specification: Post Graduate Taught

For students starting in Academic Year 2022/23

1. Course Summary

Names of programme and award title(s)	MSc Digital and Technology Solutions (Data Analytics)
Award type	Taught Masters
Mode of study	Part-time
Framework of Higher Education Qualification (FHEQ) level of final award	Level 7
Normal length of the programme	2 years
Maximum period of registration	The normal length as specified above plus 3 years
Location of study	Keele Campus
Accreditation (if applicable)	N/A
Regulator	Office for Students (OfS) and the Institute for Apprenticeships and Technical Education
Tuition Fees	<p>Fee for 2022/23: The employer pays all course fees and no fees are charged to apprentice students.</p> <p>Programme price is set at the maximum funding band for this apprenticeship standard set by the Institute for Apprenticeships and Technical Education (IfATE) which is a government non-departmental body sponsored by the Department for Education (DFE). We reserve the right to increase price in future. Fees will be paid by the employer on behalf of the apprentice using Levy or co-funding arrangements. For further information please visit: https://www.gov.uk/government/publications/apprenticeship-funding</p> <p>A full breakdown of costs is set out in the commitment statement.</p>

How this information might change: Please read the important information at <http://www.keele.ac.uk/student-agreement/>. This explains how and why we may need to make changes to the information provided in this document and to help you understand how we will communicate with you if this happens.

2. Overview of the Programme

This programme is used to deliver the Digital and Technology Solutions Specialist apprenticeship standard. Apprenticeship standards are co-designed by employers and training providers to ensure that apprentices are equipped with the skills employers need. All higher and degree apprenticeships combine work-based learning with part-time study leading to a recognised qualification. The programme has been designed for delivery in a work-based learning context, where assessments for each module of the programme provide opportunities for the student to apply the learning from the module back into their workplace context.

This programme is a collaboration between the School of Computing and Mathematics and the Keele Business School. It has been designed from both an employer and student perspective to provide distinctive and inclusive teaching for students from a wide variety of backgrounds. The course is aimed at developing an advanced knowledge of the underlying principles and concepts of Artificial Intelligence (AI) and data science, including areas such as programming and system design; data analytics, statistics and databases; visualisation; machine learning. This technical content is then complemented by the necessary leadership and management elements that prepare and equip learners to take on more senior management and leadership roles.

The course also provides students with the opportunity to apply skills and techniques to real world problems, contextualise their learning to their own employment and further develop professionalism, team working and research skills.

A graduate of this apprenticeship will become a Digital & Technology Solutions Specialist. They maintain digital and technology strategies through technology leadership; investigating, identifying and implementing technological strategic solutions. They direct digital technology provision by studying organisation goals, strategies, and practices and delivering and supporting strategic plans for implementing digital technologies. They are confident, competent and capable individuals able to apply leadership and change management skills to operate in a range of digital and technology related specialist roles.

A Digital and Technological Solutions Professional graduating from this apprenticeship will have a technical specialism in data analytics. A data analytics specialist investigates business data requirements, and applies data selection, data curation, data quality assurance and data investigation and engineering techniques. This will help the business to most effectively organise their data and they will provide advice and guidance to database designers and others in using the data structures and associated data components efficiently. They will undertake data processing to produce data sets for study and will perform investigations using techniques including machine learning to reveal new business opportunities. They also present data and investigation results along with compelling business opportunities reports to senior stakeholders.

Potential job roles include: Big data analyst; data and insight analyst; data science specialist; data management specialist; analytics lead.

During delivery we will work with you and your employer to ensure that you progress through your apprenticeship, as a job with training. This will involve regular tripartite review meetings, monitoring compliance with apprenticeship requirements, such as the 20% of the job and identifying any changes required to your learning plan. Throughout your apprenticeship, you and your employer will have access to Aptem, our apprenticeships management system, where you will be required to sign and submit documents to demonstrate your progress and adhere to compliance requirements.

Achievement of the apprenticeship is through the End Point Assessment (EPA) and further details are provided in the section titled 'How is the programme assessed?'

3. Aims of the programme

The aims of this programme are to equip Digital & Technology Solutions Specialists with the knowledge, skills and behaviours to:

- maintain digital and technology strategies through technology leadership; investigating, identifying and implementing technological strategic solutions.
- direct digital technology provision by studying organisation goals, strategies, and practices and delivering and supporting strategic plans for implementing digital technologies.
- be confident, competent and capable individuals able to apply leadership and change management skills to operate in a range of digital and technology related specialist roles.

Data Analytics Specialists will be able to:

- investigate business data requirements, and apply data selection, data curation, data quality assurance and data investigation and engineering techniques. This will help the business to most effectively organise their data and they will provide advice and guidance to database designers and others in using the data structures and associated data components efficiently.
- undertake data processing to produce data sets for study and will perform investigations using techniques including machine learning to reveal new business opportunities.
- present data and investigation results along with compelling business opportunities reports to senior

stakeholders.

4. What you will learn

The intended learning outcomes of the programme (what students should know, understand and be able to do at the end of the programme) are primarily in line with the [Digital & Technology Solutions Specialist Apprenticeship standard](#). This standard is based upon a core set of knowledge, skills and behaviours that will be supplemented by a specialism in Data Analytics, and can be described under the following headings:

- Core Technical Skills
- Core Technical Knowledge
- Core Behaviours
- Skills and Technical knowledge for Data Analytics Specialist

In addition there are further learning outcomes based on [the QAA Subject Benchmark Statement \(Computing \(Masters\)\)](#), described under the following headings:

- Subject Knowledge and Understanding
- Key or Transferable Skills (graduate attributes)

Core Technical Skills

Is able to:

S1	Identify, document, review and design complex IT enabled business processes that define a set of activities that will accomplish specific organisational goals and provides a systematic approach to improving those processes;
S2	Design and develop technology roadmaps, implementation strategies and transformation plans focused on digital technologies to achieve improved productivity, functionality and end user experience in an area of technology specialism;
S3	Deliver workplace transformations through planning and implementing technology based business change programmes including setting objectives, priorities and responsibilities with others in an area of technology specialism;
S4	Negotiate and agree digital and technology specialism delivery budgets with those with decision-making responsibility;
S5	Develop and deliver management level presentations which resonate with senior stakeholders, both business and technical;
S6	Professionally present digital and technology solution specialism plans and solutions in a well-structured business report;
S7	Demonstrate self-direction and originality in solving problems, and act autonomously in planning and implementing digital and technology solutions specialist tasks at a professional level;
S8	Be competent at negotiating and closing techniques in a range of interactions and engagements, both with senior internal and external stakeholders;
S9	Evaluate the significance of human factors to leadership in the effective implementation and management of technology enabled business processes;
S10	Develop own leadership style and professional values that contributes to building high performing teams;
S11	Apply broader technical knowledge combined with an understanding of the business context, and how it is changing, to deliver to the company's business strategy;
S12	Demonstrate effective technology leadership and change management skills for managing technology driven change and continuous improvement;
S13	Create and implement innovative technological strategies to support the development of new products, processes and services that align with the company's business strategy, and develop and communicate compelling business proposals to support these.

Core Technical Knowledge

Knows and understands:

K1	The strategic importance of technology enabled business processes, and how they are designed and managed to determine a firm's ability to compete effectively;
K2	The principles of business transformation and how organisations integrate different management functions in the context of technological change;
K3	The role of leadership in contemporary technology based organisations;
K4	Own employer's business objectives and strategy, its position in the market and how own employer adds value to its clients through the services and/or products they provide;
K5	How to justify the value of technology investments and apply benefits management and realisation;
K6	How to monitor technology related market trends and research and collect competitive intelligence;
K7	The personal leadership qualities that are required to establish and maintain an organisations technical reputation.
K8	The role of leaders as change agents and identify contributors to successful implementation;
K9	Technology road-mapping concepts and methods and how to apply them;
K10	The role of learning and talent management in successful business operations.
K11	Inspire and motivate others to deliver excellent technical solutions and outcomes
K12	Establish high levels of performance in digital and technology solutions activities
K13	Be results and outcomes driven to achieve high key performance outcomes for digital and technology solutions objectives
K14	Promote a high level of cooperation between own work group and other groups to establish a technology change led culture
K15	Develop and support others in developing an appropriate balance of leadership and technical skills
K16	Create strong positive relationships with team members to produce high performing technical teams

Core Behaviours

B1	Inspire and motivate others to deliver excellent technical solutions and outcomes
B2	Establish high levels of performance in digital and technology solutions activities
B3	Be results and outcomes driven to achieve high key performance outcomes for digital and technology solutions objectives
B4	Promote a high level of cooperation between own work group and other groups to establish a technology change led culture
B5	Develop and support others in developing an appropriate balance of leadership and technical skills
B6	Create strong positive relationships with team members to produce high performing technical teams

Skills for Data Analytics Specialist

Be able to:

SS1	Identify and select the business data that needs to be collected and transitioned from a range of data systems; acquire, manage and process complex data sets, including large-scale and real-time data;
SS2	Undertake analytical investigations of data to understand the nature, utility and quality of data, and developing data quality rule sets and guidelines for database designers;
SS3	Formulate analysis questions and hypotheses which are answerable given the data available and come to statistically sound conclusions;
SS4	Conduct high-quality complex investigations, employing a range of analytical software, statistical modelling & machine learning techniques to make data driven decisions solve live commercial problems;
SS5	Document and describe the data architecture and structures using appropriate data modelling tools, and select appropriate methods to present data and results that support human understanding of complex data sets;
SS6	Scope and deliver data analysis projects, in response to business priorities, create compelling business opportunities reports on outcomes suitable for a variety of stakeholders including senior clients and management.

Technical knowledge for Data Analytics Specialist

Knows and understands:

SK1	How key algorithms and models are applied in developing analytical solutions and how analytical solutions can deliver benefits to organisations;
SK2	The information governance requirements that exist in the UK, and the relevant organisational and legislative data protection and data security standards that exist. The legal, social and ethical concerns involved in data management and analysis;
SK3	The principles of data driven analysis and how to apply these. Including the approach, the selected data, the fitted models and evaluations used to solve data problems;
SK4	The properties of different data storage solutions, and the transmission, processing and analytics of data from an enterprise system perspective. Including the platform choices available for designing and implementing solutions for data storage, processing and analytics in different data scenarios;
SK5	How relevant data hierarchies or taxonomies are identified and properly documented;
SK6	The concepts, tools and techniques for data visualisation, including how this provides a qualitative understanding of the information on which decisions can be based.

Subject Knowledge and Understanding and Key or Transferable Skills (graduate attributes)

- a combination of theory and practice, with practice being guided by theoretical considerations
- an ability to critically review the literature, which includes identifying all of the key developments in a particular area of study, critically analysing them and identifying limitations and avenues for further development or explanation

Keele Graduate attributes

Engagement with this programme will enable you to develop your intellectual, personal and professional capabilities. At Keele, we call these our ten Graduate Attributes and they include independent thinking, synthesizing information, creative problem solving, communicating clearly, and appreciating the social, environmental and global implications of your studies and activities. Our educational programme and learning environment is designed to help you to become a well-rounded graduate who is capable of making a positive and valued contribution in a complex and rapidly changing world, whichever spheres of life you engage in after your studies are completed.

Further information about the Keele Graduate Attributes can be found here: <http://www.keele.ac.uk/journey/>

5. How is the programme taught?

Learning and teaching methods used on the programme vary according to the subject matter and level of

the module. They include the following:

- Pre-recorded video materials that include introductions to key concepts and theories as well as demonstrations of tools and techniques
- On-campus introductory lectures and practicals
- Live online seminars and academic Q&A sessions
- Online practicals (supported with live online sessions and forums)
- Web-based learning and directed reading
- Group working

Apart from these formal activities, students are also provided with regular opportunities to talk through particular areas of difficulty, and any special learning needs they may have, with their Personal Tutors, Work-place Mentors or module lecturers on a one-to-one basis.

These learning and teaching methods enable students to achieve the learning outcomes of the programme in a variety of ways. For example:

- Pre-recorded video materials and lectures allow apprentices to gain a systematic knowledge and understanding of relevant concepts and ideas and how to apply them to authentic problems.
- Practical sessions encourage apprentices to work independently, enabling them to solve problems in new or unfamiliar environments
- Web-based learning and directed reading allow apprentices to develop their subject interest and their ability to reflect on their own learning and to take responsibility for its development.
- Group working sessions enable apprentices to further develop their team working and communication skills, as well as apply the technicals skills and knowledge taught on the programme.

6. Teaching Staff

The academic staff involved with the delivery of this apprenticeship currently comprises Professors, Readers, Senior Lecturers and Lecturers, of whom a number are Associate Fellows, Fellows and Senior Fellows of the Higher Education Academy. Teaching will also involve demonstrators and session teachers who have significant experience in working in data analytics and computer science (both in industry and research) and delivering practicals to apprentices. More information about the staff from each School is available at <http://www.keele.ac.uk/scm/staff/> and <https://www.keele.ac.uk/kbs/staff/>.

The University will attempt to minimise changes to our core teaching teams, however, delivery of the programme depends on having a sufficient number of staff with the relevant expertise to ensure that the programme is taught to the appropriate academic standard.

Staff turnover, for example where key members of staff leave, fall ill or go on research leave, may result in changes to the programme's content. The University will endeavour to ensure that any impact on students is limited if such changes occur.

7. What is the structure of the programme?

Our degree courses are organised into modules. Each module is usually a self-contained unit of study and each is usually assessed separately with the award of credits on the basis of 1 credit = 10 hours of student effort. An outline of the structure of the programme is provided in the tables below. The majority of modules containing a set of introductory sessions on campus, followed by 7 weeks of online, supported learning. Modules are delivered sequentially so that the teaching on one module finishes before another starts.

The modules will be delivered in the following order with the:

CSC-40106 System Design and Programming; CSC-40108 Data Analytics and Databases; CSC-40110 Visualisation for Data Analytics; MAN-40728 Leading in a Complex World; CSC-40112 Applications of AI, Machine Learning and Data Science; MAN-40230 Digital Transformation and the Digital Organisation; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40116 MSc Project.

CSC-40118 Preparing for the Digital & Technology Solutions Specialist End Point Assessment (EPA) will run alongside all modules and once passed, along with the MSc project, apprentices will then enter the EPA Gateway. Full details related to the EPA and EPA gateway can be found in the Apprenticeship Standard documentation: https://www.instituteforapprenticeships.org/media/1966/st0482_digital-technology-solutions-specialist_17_ap-final-for-publishing.pdf

This programme is a full calendar year programme but taught elements may not take place throughout the whole year.

Year	Compulsory	Optional		Electives	
		Min	Max	Min	Max
Level 7	180	0	0	0	0

Module Lists

Level 7

Compulsory modules	Module Code	Credits	Period
System Design & Programming (Apprenticeship)	CSC-40106	15	Year 1
Data Analytics and Databases (Apprenticeship)	CSC-40108	15	Year 1
Visualisation for Data Analytics (Apprenticeship)	CSC-40110	15	Year 1
Applications of AI, Machine Learning and Data Science (Apprenticeship)	CSC-40112	15	Year 1
Collaborative Digital & Technology Solutions Development (Apprenticeship)	CSC-40114	15	Year 1
Preparing for the Digital & Technology Solutions Specialist End Point Assessment	CSC-40118	0	Year 1
Digital Transformation and the Digital Organisation (DTTS Apprenticeship)	MAN-40230	30	Year 1
Leading in a Complex World (DTTS Apprenticeship)	MAN-40728	15	Year 1
MSc Project (Apprenticeship)	CSC-40116	60	Year 2

Learning Outcomes

The table below sets out what students learn in the programme and the modules in which that learning takes place. Details of how learning outcomes are assessed through these modules can be found in module specifications.

Level 7

Core Technical Skills

Is able to:

	Learning Outcome	Module in which this is delivered
S1	Identify, document, review and design complex IT enabled business processes that define a set of activities that will accomplish specific organisational goals and provides a systematic approach to improving those processes;	CSC-40106 System Design & Programming; CSC-40114 Collaborative Digital & Technology Solutions Development

	Learning Outcome	Module in which this is delivered
S2	Design and develop technology roadmaps, implementation strategies and transformation plans focused on digital technologies to achieve improved productivity, functionality and end user experience in an area of technology specialism;	CSC-40114 Collaborative Digital & Technology Solutions Development
S3	Deliver workplace transformations through planning and implementing technology based business change programmes including setting objectives, priorities and responsibilities with others in an area of technology specialism;	MAN-40230 Digital Transformation and the Digital Organisation
S4	Negotiate and agree digital and technology specialism delivery budgets with those with decision-making responsibility;	MAN-40230 Digital Transformation and the Digital Organisation
S5	Develop and deliver management level presentations which resonate with senior stakeholders, both business and technical;	CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40108 Data Analytics and Databases
S6	Professionally present digital and technology solution specialism plans and solutions in a well-structured business report;	CSC-40108 Data Analytics and Databases; CSC-40110 Visualisation for Data Analytics; CSC-40112 Applications of AI, Machine Learning and Data Science
S7	Demonstrate self-direction and originality in solving problems, and act autonomously in planning and implementing digital and technology solutions specialist tasks at a professional level;	All modules
S8	Be competent at negotiating and closing techniques in a range of interactions and engagements, both with senior internal and external stakeholders;	MAN-40728 Leading in a Complex World
S9	Evaluate the significance of human factors to leadership in the effective implementation and management of technology enabled business processes;	CSC-40114 Collaborative Digital & Technology Solutions Development
S10	Develop own leadership style and professional values that contributes to building high performing teams;	MAN-40728 Leading in a Complex World; CSC-40114 Collaborative Digital & Technology Solutions Development
S11	Apply broader technical knowledge combined with an understanding of the business context, and how it is changing, to deliver to the company's business strategy;	MAN-40230 Digital Transformation and the Digital Organisation
S12	Demonstrate effective technology leadership and change management skills for managing technology driven change and continuous improvement;	MAN-40230 Digital Transformation and the Digital Organisation
S13	Create and implement innovative technological strategies to support the development of new products, processes and services that align with the company's business strategy, and develop and communicate compelling business proposals to support these.	MAN-40230 Digital Transformation and the Digital Organisation

Core Technical Knowledge

Knows and understands:

	Learning Outcome	Module in which this is delivered
K1	The strategic importance of technology enabled business processes, and how they are designed and managed to determine a firm's ability to compete effectively;	MAN-40230 Digital Transformation and the Digital Organisation
K2	The principles of business transformation and how organisations integrate different management functions in the context of technological change;	MAN-40230 Digital Transformation and the Digital Organisation
K3	The role of leadership in contemporary technology based organisations;	MAN-40728 Leading in a Complex World
K4	Own employer's business objectives and strategy, its position in the market and how own employer adds value to its clients through the services and/or products they provide;	MAN-40230 Digital Transformation and the Digital Organisation
K5	How to justify the value of technology investments and apply benefits management and realisation;	MAN-40230 Digital Transformation and the Digital Organisation
K6	How to monitor technology related market trends and research and collect competitive intelligence;	CSC-40114 Collaborative Digital & Technology Solutions Development
K7	The personal leadership qualities that are required to establish and maintain an organisations technical reputation.	MAN-40728 Leading in a Complex World
K8	The role of leaders as change agents and identify contributors to successful implementation;	MAN-40728 Leading in a Complex World
K9	Technology road-mapping concepts and methods and how to apply them;	CSC-40114 Collaborative Digital & Technology Solutions Development
K10	The role of learning and talent management in successful business operations.	MAN-40230 Digital Transformation and the Digital Organisation
K11	Inspire and motivate others to deliver excellent technical solutions and outcomes	MAN-40728 Leading in a Complex World
K12	Establish high levels of performance in digital and technology solutions activities	MAN-40230 Digital Transformation and the Digital Organisation
K13	Be results and outcomes driven to achieve high key performance outcomes for digital and technology solutions objectives	MAN-40230 Digital Transformation and the Digital Organisation
K14	Promote a high level of cooperation between own work group and other groups to establish a technology change led culture	MAN-40728 Leading in a Complex World
K15	Develop and support others in developing an appropriate balance of leadership and technical skills	CSC-40114 Collaborative Digital & Technology Solutions Development
K16	Create strong positive relationships with team members to produce high performing technical teams	CSC-40114 Collaborative Digital & Technology Solutions Development

Core Behaviours

	Learning Outcome	Module in which this is delivered
B1	Inspire and motivate others to deliver excellent technical solutions and outcomes	CSC-40114 Collaborative Digital & Technology Solutions Development; MAN-40230 Digital Transformation and the Digital Organisation
B2	Establish high levels of performance in digital and technology solutions activities	CSC-40114 Collaborative Digital & Technology Solutions Development; MAN-40230 Digital Transformation and the Digital Organisation
B3	Be results and outcomes driven to achieve high key performance outcomes for digital and technology solutions objectives	MAN-40230 Digital Transformation and the Digital Organisation
B4	Promote a high level of cooperation between own work group and other groups to establish a technology change led culture	CSC-40114 Collaborative Digital & Technology Solutions Development; MAN-40230 Digital Transformation and the Digital Organisation
B5	Develop and support others in developing an appropriate balance of leadership and technical skills	CSC-40114 Collaborative Digital & Technology Solutions Development; MAN-40230 Digital Transformation and the Digital Organisation
B6	Create strong positive relationships with team members to produce high performing technical teams	CSC-40114 Collaborative Digital & Technology Solutions Development; MAN-40230 Digital Transformation and the Digital Organisation

Skills for Data Analytics Specialist

Be able to:

	Learning Outcome	Module in which this is delivered
SS1	Identify and select the business data that needs to be collected and transitioned from a range of data systems; acquire, manage and process complex data sets, including large-scale and real-time data;	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40116 MSc Project
SS2	Undertake analytical investigations of data to understand the nature, utility and quality of data, and developing data quality rule sets and guidelines for database designers;	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SS3	Formulate analysis questions and hypotheses which are answerable given the data available and come to statistically sound conclusions;	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SS4	Conduct high-quality complex investigations, employing a range of analytical software, statistical modelling & machine learning techniques to make data driven decisions solve live commercial problems;	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SS5	Document and describe the data architecture and structures using appropriate data modelling tools, and select appropriate methods to present data and results that support human understanding of complex data sets;	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SS6	Scope and deliver data analysis projects, in response to business priorities, create compelling business opportunities reports on outcomes suitable for a variety of stakeholders including senior clients and management.	CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project; CSC-40118 Preparing for the Digital & Technology Solutions Specialist End Point Assessment

Technical knowledge for Data Analytics Specialist

Knows and understands:

	Learning Outcomes	Module in which this is delivered
SK1	How key algorithms and models are applied in developing analytical solutions and how analytical solutions can deliver benefits to organisations;	CSC-40106 System Design & Programming; CSC-40108 Data Analytics and Databases ; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SK2	The information governance requirements that exist in the UK, and the relevant organisational and legislative data protection and data security standards that exist. The legal, social and ethical concerns involved in data management and analysis;	CSC-40108 Data Analytics and Databases; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SK3	The principles of data driven analysis and how to apply these. Including the approach, the selected data, the fitted models and evaluations used to solve data problems;	CSC-40108 Data Analytics and Databases; CSC-40110 Visualisation for Data Analytics; CSC-40114 Collaborative Digital & Technology Solutions Development; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SK4	The properties of different data storage solutions, and the transmission, processing and analytics of data from an enterprise system perspective. Including the platform choices available for designing and implementing solutions for data storage, processing and analytics in different data scenarios;	CSC-40108 Data Analytics and Databases; CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40116 MSc Project
SK5	How relevant data hierarchies or taxonomies are identified and properly documented;	CSC-40108 Data Analytics and Databases
SK6	The concepts, tools and techniques for data visualisation, including how this provides a qualitative understanding of the information on which decisions can be based.	CSC-40110 Visualisation for Data Analytics

Subject Knowledge and Understanding and Key or Transferable Skills (graduate attributes)

a combination of theory and practice, with practice being guided by theoretical considerations	CSC-40112 Applications of AI, Machine Learning and Data Science; CSC-40110 Visualisation for Data Analytics; CSC-40116 MSc Project; MAN-40230 Digital Transformation and the Digital Organisation
an ability to critically review the literature, which includes identifying all of the key developments in a particular area of study, critically analysing them and identifying limitations and avenues for further development or explanation	CSC-40116 MSc Project

Subject Specific Skills	
Learning Outcome	Module in which this is delivered
See tables above	See above

8. Final and intermediate awards

The Master of Science Digital and Technology Solutions (Data Analytics) degree will be classified in accordance with the University integrated degree regulations. If an apprentice fails the EPA a degree cannot be awarded and vice versa.

Master of Science Digital and Technology Solutions (Data Analytics)	180 credits	Must include passing of the EPA
Postgraduate Diploma in Digital and Technology Solutions (Data Analytics)	120 credits	This must include 120 credits at Level 7 in the following modules: System Design & Programming (Apprenticeship); Data Analytics and Databases (Apprenticeship); Visualisation for Data Analytics (Apprenticeship); Applications of AI, Machine Learning and Data Science (Apprenticeship); Collaborative Digital & Technology Solutions Development (Apprenticeship); Preparing for the Digital & Technology Solutions Specialist End Point Assessment; Digital Transformation and the Digital Organisation (DTTS Apprenticeship); Leading in a Complex World (DTTS Apprenticeship)
Postgraduate Certificate in Digital and Technology Solutions (Data Analytics)	60 credits	You will require at least 60 credits at Level 7 in the following modules: System Design & Programming (Apprenticeship); Data Analytics and Databases (Apprenticeship); Visualisation for Data Analytics (Apprenticeship); Applications of AI, Machine Learning and Data Science (Apprenticeship)

9. How is the Programme Assessed?

The wide variety of assessment methods used on this programme at Keele reflects the broad range of knowledge and skills that are developed as you progress through the degree programme. Teaching staff pay particular attention to specifying clear assessment criteria and providing timely, regular and constructive feedback that helps to clarify things you did not understand and helps you to improve your performance. The following list is representative of the variety of assessment methods used on your programme:

- Courseworks
- Reports
- Presentations
- Projects
- Reflective Analysis

Wherever possible, assessment is tailored to the learner's employer so that problems and datasets are as authentic as possible.

The End-Point Assessment (EPA) is the final stage of the apprenticeship. There are two parts to the EPA:

1. A Project Report (a written account of a set of practical tasks undertaken within a work based project context), which the independent assessor assesses and grades.
2. A Professional Discussion (a structured discussion with the independent assessor allowing the apprentice to respond to questions using a portfolio), which the independent assessor assesses and grades.

You are prepared for the EPA via the 0-credit module "CSC-40118 Preparing for the Digital & Technology Solutions Specialist End Point Assessment". This module includes support for the development of the portfolio of work based projects (which forms the basis of the professional discussion), a project terms of reference and a mock professional discussion. This module has a pass/fail threshold and provides the evidence of readiness needed to enter the EPA gateway.

Full details can be found in the [END-POINT ASSESSMENT PLAN](#).

Marks are awarded for summative assessments designed to assess your achievement of learning outcomes. You will also be assessed formatively to enable you to monitor your own progress and to assist staff in identifying and addressing any specific learning needs. Feedback, including guidance on how you can improve the quality of your work, is also provided on all summative assessments within three working weeks

of submission, unless there are compelling circumstances that make this impossible, and more informally in the course of tutorial and seminar discussions.

10. Accreditation

This programme does not have accreditation from an external body but is mapped to the appropriate Apprenticeship Standard.

11. University Regulations

The University Regulations form the framework for learning, teaching and assessment and other aspects of the student experience. Further information about the University Regulations can be found at: <http://www.keele.ac.uk/student-agreement/>

If this programme has any exemptions, variations or additions to the University Regulations these will be detailed in an Annex at the end of this document titled 'Programme-specific regulations'.

12. What are the typical admission requirements for the Programme?

See the relevant course page on the website for the admission requirements relevant to this programme: <https://www.keele.ac.uk/study/>

Under UK Government rules, apprentices must be employed for a minimum of 30 hours per week and must have the right to live and work in the UK (applies only in England). An apprentice cannot be self-employed. The employer must enter into an Apprenticeship Agreement with the apprenticeship student. All candidates must be employed in a role related to the subject matter of the apprenticeship and be sponsored by their employer. Applications can only be made through the sponsoring employer. The University will consider all such applications and will have the final decision whether to accept the candidate for entry to the programme. Apprentices must be employed by one of Keele's contracted employer partners.

Apprentices without level 2 English and maths will normally need to have achieved this level prior to starting the programme. For those with an education, health and care plan or a legacy statement the apprenticeships English and maths minimum requirement is Entry Level 3 and British Sign Language qualification are an alternative to English qualifications for whom this is their primary language.

Relevant or prior experience will be taken into account when considering a candidate's suitability for the programme.

At application applicants are required to undertake a 'Skills Scan' where they are asked to self-assess against the knowledge, skills and behaviour of the apprenticeships standard. Applicants are also asked if they want to make an application for Recognition of Prior Learning (RPL) through the University procedure. There is a requirement for new knowledge and skills to be developed through apprenticeships, with a minimum duration of one year. Recognition of Prior Learning is considered on a case-by-case basis. The University's guidance can be found here: www.keele.ac.uk/qa/accreditationofpriorlearning

Note that individual employers may set higher entry thresholds based on their recruitment requirements.

13. How are students supported on the programme?

Support for apprentice learning on the Programme is provided in the following ways:

- Module lecturers, teaching fellows and computing laboratory demonstrators are responsible for providing support for learning on the modules. They also give individual feedback on coursework assignments and more general feedback on examinations and tests. Apprentices will be able to access support through electronic systems from the Apprenticeship teaching team. Every apprentice is allocated to a Personal Academic Tutor (Personal Tutor) who is responsible for reviewing and advising on apprentices academic progress . Apprentices will be able to communicate with their personal tutor via email and online office hours, or by appointment outside these hours, for support. Apprentices will also be able to seek support from the teaching team and their tutor during residential/on-campus periods.
- Every apprentice is allocated to a Personal Workplace Tutor who is responsible for reviewing and advising on apprentices' academic-related workplace-based progress. The Personal Workplace Tutor is an employee of the organisation where the apprentice works, and is appointed in agreement with the employer.
- Personal Academic Tutors and Personal Workplace Tutors also act as first points of contact for apprentices on non-academic issues which may affect their learning and can refer apprentices on to a range of specialist health, welfare and financial services co-ordinated by the University's Student Services or on to specialist services offered by their employer.

14. Learning Resources

The programme is taught in lecture theatres, teaching rooms, computer laboratories and online via the VLE and MS Teams. The learning resources available to apprentices on the Programme include:

Dedicated networked PC laboratories within the School of Computing and Mathematics, which use the Microsoft Windows and GNU/Linux operating systems and provide a wide range of supported software. The School buildings are accessible 24 hours a day. Apprentices have individual email accounts and file stores on University and School servers.

Dedicated facilities at their employer's premises (provided by their employer), which use the Microsoft Windows and GNU/Linux operating systems and provide a wide range of supported software. These PCs are accessible according to the schedule set by the employer and should be accessible at least for such time that allows the apprentices to do their laboratory work and computer based private study required for the modules that they study. Apprentices have individual email accounts and file stores on the employer's servers. Additional facilities are provided for projects at the employer's premises (provided by their employer).

The Keele Learning Environment (KLE) which provides easy online access to a range of learning resources including lecture notes and other resources supplied in modules.

The extensive collection of books and journals relevant to undergraduate study held in the University Library. Much of this material is also accessible online to Keele apprentices from anywhere in the world with a University username and password.

15. Additional Costs

As to be expected there will be additional costs for inter-library loans and potential overdue library fines, print and graduation. We do not anticipate any further costs for this programme.

16. Quality management and enhancement

The quality and standards of learning in this programme are subject to a continuous process of monitoring, review and enhancement.

- The School Education Committee is responsible for reviewing and monitoring quality management and enhancement procedures and activities across the School.
- Individual modules and the programme as a whole are reviewed and enhanced every year in the annual programme review which takes place at the end of the academic year.
- The programmes are run in accordance with the University's Quality Assurance procedures and are subject to periodic reviews under the Internal Quality Audit (IQA) process.

Student evaluation of, and feedback on, the quality of learning on every module takes place every year using a variety of different methods:

- The results of student evaluations of all modules are reported to module leaders and reviewed by the Programme Committee as part of annual programme review.
- Findings related to the programme from the annual Postgraduate Taught Experience Survey (PTES), and from regular surveys of the student experience conducted by the University, are subjected to careful analysis and a planned response at programme and School level.
- Feedback received from representatives of students on the programme is considered and acted on at regular meetings of the Student Staff Voice Committee.

The University appoints senior members of academic staff from other universities to act as external examiners on all programmes. They are responsible for:

- Approving examination questions
- Confirming all marks which contribute to a student's degree
- Reviewing and giving advice on the structure and content of the programme and assessment procedures

Information about current external examiner(s) can be found here:

<http://www.keele.ac.uk/ga/externalexaminers/currentexternalexaminers/>

17. The principles of programme design

The programme described in this document has been drawn up with reference to, and in accordance with the guidance set out in, the following documents:

- a. UK Quality Code for Higher Education, Quality Assurance Agency for Higher Education:

<http://www.qaa.ac.uk/quality-code>

b. Apprenticeship Standard: [https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-specialist-\(integrated-degree\)-v1-0](https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-specialist-(integrated-degree)-v1-0)

c. Keele University Regulations and Guidance for Students and Staff: <http://www.keele.ac.uk/regulations>

Version History

This document

Date Approved: 04 November 2021

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2021/22	EDWARD DE QUINCEY	04 November 2021	