Programme Specification: Post Graduate Taught

For students starting in Academic Year 2024/25

1. Course Summary

Names of programme and award title(s)	MSc Technical Leadership (Analytical Science) MSc Technical Leadership (Biomedical Science) MSc Technical Leadership (Specialist Data Processing) (Specialism: Analytical or Biomedical Science or Specialist Data Processing) (Delivering the Research Scientist Apprenticeship)
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)	Not applicable
Regulator	Office for Students (OfS); Institute for Apprenticeships and Technical Education (IfATE)
Tuition Fees	Fees: The employer pays all course fees and no fees are charged to apprentice students. 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-from-may-2017 A full breakdown of costs is set out in the commitment statement.

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

The MSc in Technical Leadership programme is used to deliver the Research Scientist apprenticeship standard, which was approved in May 2019. **The broad purpose of the occupation is someone who is primarily involved in planning, leading and conducting experiments and analysing results, either with a definite end use, for example to develop new products, processes or commercial applications, or to broaden scientific understanding in general**.

Such apprentices provide scientific and technical leadership, giving a clear sense of purpose and driving strategic intent. They can expect to lead on business critical projects - managing the design and implementation of such projects both internally and externally, disseminating findings to internal and external stake-holders and making strategic recommendations based upon the findings of the project. They take into account new scientific methods and breakthroughs, identifying longer-term opportunities and risks. They will be able to effectively collaborate with both industry and academia, working in multidisciplinary teams, to apply results of research and develop new techniques, products or practices. They are responsible for developing ethical, innovative research practices and programmes with the ability to deliver results. They are a role model, with responsibility for those in senior positions and significant organisational budgets. In their daily work, an employee in this occupation interacts with a wide range of individuals and teams. This is due to the varied work and leadership roles that the individual undertakes through their work. This means that these varied interactions require them to communicate across businesses and industries and lead on ensuring scientific information is communicated in efficient ways.

For the September 2024 intake, three strands of the *MSc in Technical Leadership* will be running: one in Analytical Science, one in Biomedical Science, one in Specialist Data Processing. Apprentices will benefit through the programme from the expertise of staff at Keele University in analytical chemistry or biomedical science, or image processing through deep learning, management and business skills, as well as from the distinctive scientific interests of the professional partners.

The programme is delivered in two stages: the first year comprises studying 5 taught modules:

- MAN-40160: Project & Processes (30 credits) / blended delivery
- PHY-40029: Data Analysis (15 credits) / blended delivery
- CHE-40044: Research Communication (15 credits) / blended delivery
- R&D (30 credits): in Analytical Science (CHE-40042) or Biomedical Science (LSC-40069) or Specialist Data Processing (CHE-40060)/ 2-week residential
- MAN-40158: Leading Teams (30 credits) / blended delivery

The programme capitalises on Keele's interdisciplinary heritage and combines advanced technical science modules with bespoke content from the Keele Business School to develop the technical leaders of the future. It is delivered over a two-year period with specialist routes in analytical sciences and biomedical science.

In the second year, apprentices undertake an extended work-place project (CHE-40046: Work Project: 60 credits) at their employer's premises, with the continuous support of the Keele academic staff.

Although the Knowledge, Skills and Behaviours (KSBs) requirements of the Apprenticeship are to be met within the programme, on-the-job learning will be taking into account, managed and monitored through various assessments, engagement of employers with the learning, and group discussions of apprentices in the (virtual) class room.

In addition to the development of discipline-specific research and technical skills, apprentices will be supported in enhancing key professional and employability skills through developing critical thinking, innovation, reflective writing, autonomous learning and written and oral presentation skills; all vital skills for future employment, lifelong learning and continued professional development irrespective of the apprentice's chosen career path.

The programme has been designed with a University-wide vision to learning and teaching: 3 Schools across 2 Faculties, along with the Keele Institute for Innovation and Teaching Excellence, have been involved in the course design, in partnership with employers, using the CoDesignS framework, which makes the programme particularly distinctive in the UK Higher Education Sector. The programme title encompasses this distinctive conjunction of management for technical science.

This programme will prepare the Technical Leaders of 2024 onwards, in posts such as Senior Technical Managers, Senior Scientific Managers, and Senior Project Managers.

3. Aims of the programme

The broad educational aims of the programme are given here according to three generic categories:

KNOWLEDGE (as stated in the original Research Scientist Standards)

K1 Subject specific knowledge: A deep and systemic understanding of a named / recognised scientific subject as found in an industrial setting, such as biology, chemistry or physics, found in the nuclear, food manufacture, pharmacology or energy production sectors, at a level that allows strategic and scientific decision making, while

taking account of inter relationships with other relevant business areas / disciplines.

K2 Management, leadership and effective communication. Organisation objectives and where their role contributes to the success achievement of these objectives. How to communicate effectively with a wide range of senior leaders across different departments, up and down the supply chain, within their own team. Advanced mixed media communication, such as presentations, report writing (technical and non-technical) negotiation and influencing. Leadership within a team of multi discipline specialists at different levels across the organisation, ensuring a shared vision and commitment to success. Effective project management as used in their employer's environment with regard to quality, cost and time. The employer's organisational structure and where their own role fits.

K3 Ethics, regulation and registration: All current relevant national and international regulations needed to carry out the role. This will include scientific regulation, health and safety and laboratory safe practice, anti-bribery and anti-corruption. Ethical scientific practice and the employer's processes and procedures surrounding professional conduct. How to identify, record, mitigate and manage risk. The impact of failure and how to manage risk on the business. The benefits of equality of diversity in the workplace.

K4 Research methodologies: Methodologies appropriate to the sector and how to formulate and apply a hypothesis. Appropriate application of scientific process. The unpredictability of research projects and the need to adapt and adjust daily planning needs to accommodate new developments.

K5 Data analysis and evaluation: Statistical analysis techniques, numerical modelling techniques and how they are applied in context. How to interpret and categorise data to make informed and objective decisions against the goals and targets of the project. How to evaluate and interpret the data and associated analysis against company objectives.

K6 Data management: How to safely store and handle data in line with national and international data protection and cyber security regulations that apply to the role. How to manage and store data in line with employer processes and security approach. How to create an appropriate data management plan.

K7 Entrepreneurial and enterprise: How to consider a multi solution approach to the objective in the key stages of a project. Market analysis awareness (SWOT / PESTLE / feasibility studies) and how to assess the impact of the project on the business. Intellectual property rights as they apply to the role and specific projects. Value for money and the ability to use market analysis to make go / no go decisions.

K8 Development of self and others: The importance of continuing professional development and how to maintain their own specialist knowledge in an ever-evolving environment. How to effectively coach and mentor colleagues, peers or team members to address identified skills gaps, using appropriate methods. How to upskill non-technical colleagues to enable them to complete their own role as needed.

SKILLS (as stated in the Research Scientist Standards)

S1 Scientific Knowledge: Apply a range of advanced, new and emerging practical and experimental skills appropriate to the role (e.g. chemical synthesis, bio analysis, computational modelling).

S2 Data Collection and Reporting: Capture and evaluate data critically drawing a logical conclusion, e.g. Case Report Forms, Data Management Plans, Data Review Plans, edit checks and User Acceptance Testing Plans.

S3 Commercial and Business Issues: Identify issues, including intellectual property and the commercial demands of the business environment. Understand the scientific objectives of work undertaken and its relevance to the organisation.

S4 Communication Skills: Write extended reports and critique others' work across a range of documentation, e.g. protocols, consent forms and scientific reports. Deliver oral presentations and answer questions about their work and/or the work of their team. Utilise interpersonal skills, communication and assertiveness to persuade, motivate and influence. Discuss work constructively and objectively with colleagues, customers and others; respond respectfully to and acknowledge the value of alternate views and hypothesis.

S5 Project Management and Leadership: Generate effective project plans to include management of scope, schedules, budget and risk. Organise resources, budgets, tasks and people. Co-ordinate team activities to meet project requirements and quality processes. Adapt scientific strategy/delivery to be consistent with requirements. e.g. client, regulatory, ethical, geographic.

S6 Critical Thinking: Conceptualise, evaluate and analyse information to solve problems.

S7 Research and dissemination: Frame research questions and methodology drawing from current sources e.g. literature and databases. Produce intellectual insight and innovations in their own discipline to be shared with colleagues, peers and wider stakeholders internal and external to the business.

S8 Developing others: Apply a range of coaching and mentoring techniques with colleague's peers and team members, selecting the correct method to suit the situation and the person being coached / mentored.

BEHAVIOURS (as stated in the Research Scientist Standards)

B1 Team Working: Collaboration, influence, and respect for others

B2 Flexibility and Adaptability: Responsiveness to change, adjusting to different conditions, technologies, situations and environments.

B3 Integrity and Reliability: Respect for the confidentiality of individuals and company information. An intrinsic ethical stance to all aspects of day to day activities. Reputation of trust internally and externally.

B4 Management of Expectations of senior management, study sponsors, vendors, investigational sites and key opinion leaders.

B5 Accountability: For self and others to ensure that actions are in the best interest of affected parties.

B6 Planning, Prioritisation and Organisation: Effective time management

B7 Continuing Professional Development (CPD): Accountability of own and others development needs, undertaking CPD. Curiosity of science and proactively develops knowledge to ensure that scientific and business decisions are based on strong science.

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), can be described under the following headings:

- Subject-specific knowledge, understanding and skills
- Generic, Intellectual and Transferrable Skills, including Employability Skills and Attitudes

Subject-specific knowledge, understanding and skills

Subject-specific knowledge in the MSc Technical Leadership is structured from two perspectives:

- Firstly, the breadth and substance of the science strand (analytical, biomedical or image processing) and its applications spanning across various disciplines (chemistry, environmental science or biochemistry, biomedical science or medical physics for example) and then the knowledge and understanding of numerous specific techniques (e.g. mass-spectrometry or deep learning), and this embedded in the understanding of leadership and management skills in a 21st century organisation.
- Secondly, the extended research training which takes place in the workplace, requires the knowledge and broad understanding of key concepts of the organisation in which the project takes place, as well as technical knowledge.

The programme will enable all learners to:

1. Describe and critically assess a wide range of instrumentation and techniques relevant to analytical or biomedical science, or a wide range of methods for data collection / cleaning / visualisation alongside machine learning algorithms for specialist data processing, and subsequently use these techniques and methods competently with regard to quality assurance issues, taking into account the inherent limitations of the given practical activities.
2. Engage effectively with the research literature within the specialism of study (including regulations and methods validation or domain representation and bias removal), and use it to advance their understanding.
3. Demonstrate professional competency in practical work and critical analysis of the resulting experimental data to draw valid conclusions, through for instance setting-up examples of standard operating procedures (e.g. calibration or quality control).
4. Describe and explain appropriate methods for data analysis and interpretation and apply these to experimental datasets of varying complexity, using a selection of appropriate software, databases and other digital resources.
5. Work safely and effectively (inc. in the laboratory or a clnical setting) and manage risk assessments and other practices in a competent fashion, maintaining accurate and relevant records of their work (inc. a data management plan).
6. Be responsible for managing different streams of work and leading on/designing and carrying out trails of process and procedures and translation of science to action. Alongside also designing, developing, implementing and evaluating these business changes

Generic, Intellectual and Transferrable Skills, including Employability Skills and Attitudes

Graduates from this programme will be able to:

1. Understand and handle scientific literature relevant to their chosen research area and introduce the

processes of research planning through the development of a detailed research proposal.
2. Engage with and carry out a variety of science communication activities and select appropriate means for a specific audience, such as presenting at conferences, academic writing, outreach activities.
3. Audit their personal research skills and act upon the outcomes to enhance these skills and subsequently tackle and solve problems with confidence and independence, and act autonomously in planning and implementing tasks at a professional or equivalent level.
4. Competently plan, organise and manage a programme of independent experimental work, and to demonstrate self-direction, dedication and originality to independent learning.
5. Understand the need to comply with local health and safety rules, and the necessity for risk assessment and the health and safety issues relevant to the laboratory research work.
6. Promote an integrated approach to theoretical knowledge, understanding and practical implications of the scientific work alongside personal thoughts and experiences, and show originality in the application of new knowledge.

Keele University identifies attributes that characterise its graduates due to its distinctive curriculum. The programme's structure, content, delivery and intended learning outcomes are designed to enable apprentices to develop these attributes, balancing specialist and expert knowledge with a broad outlook and independent approach. The programme is strongly aligned with the key aspects of Keele's distinctive curriculum: interdisciplinarity, sustainability, internationality and employability.

Analytical Science, Biomedical Science or Specialist Data Processing are inherently interdisciplinary as they utilise techniques and methodologies, originating mostly from the natural sciences and health sectors, and apply them to the identification, quantification and characterisation of substances, materials or images of relevance to a wide-range of contexts from the (bio)medical and pharmaceutical to the environmental and engineering.

Awareness of sustainability is central to the work of laboratory scientists is no exception. Senior scientists in the Analytical Science, Biomedical Science or Medical Physics and Clinical Engineering sectors need to ensure their organisations, facilities and practices conform to good sustainability guidelines, including the life-cycle of instrumentation, and energy and resource efficient (laboratory) infrastructure and practices. Such senior scientists contribute strongly to the monitoring of products and the environment, to ensure the safety of living organisms and the sustainability of our environment.

Senior scientists in the Analytical Science, Biomedical Science or Medical Physics and Clinical Engineering sectors are part of a wider set of international activities, and industrial and academic partners across globe collaborate and interact both in research and in professional practice. Because methods and standards may vary amongst laboratories and clinical settings, there is always a need to spread standardisation of scientific methods and procedures in order to enhance quality standards and methods validation.

Analytical, Biomedical Science or Specialist Data Processing graduates are first and foremost scientists, with a broad scientific knowledge and skills. They are problem-driven, experienced in calling upon the concepts, understanding and practices derived from the core sciences, to solve problems related to identifying and quantifying substances or lesions often at very low levels of existence. They then have to interpret their findings and report to an educated but often non-scientific audience such as business managers, government agencies or the legal profession. Such skills are appropriate and highly sought-after in most scientific occupations outside the immediate analytical/biomedical/ medical physics & clinical engineering arenas. In this way, this programme develops key employability skills for a broad range of scientific professions, as well as for other roles within science-based businesses and organisations.

'Your Keele Journey - the Keele Approach to Education' is the name given to the package of additional opportunities offered to students alongside their academic programmes. It provides you with an opportunity to design your individual student experience, in order to develop your knowledge, skills, attitudes and values and enhance your talents so you can make a difference to your world.

Your Keele journey will give you the opportunity to benefit from the highest quality research-informed academic experience. We will offer you the support that you need to make the most of your education. The skills and attributes you develop will help to make you highly employable and able to make informed career choices about your future.

We will also support you to become well-informed about the issues surrounding the sustainability of our planet's natural systems and its inhabitants, so that you can use your knowledge and skills to create a more sustainable world. As a Keele student, you will join an international academic community, and we will help you to play your part in a globalised society. As a Keele graduate we want you to leave us clear about who you are and what you want to be, and be equipped to achieve your goals. It's little wonder the Keele educational approach is considered an amazing foundation for life. It's the Keele difference. You can find more information on the Keele Approach to Education here:
https://www.keele.ac.uk/study/undergraduate/additionalopportunities/

The Keele Graduate Attributes

The Keele Graduate Attributes are the qualities (skills, values and mindsets) which you will have the opportunity to develop during your time at Keele through both the formal curriculum and also through co- and extra-curricular activities (e.g., work experience, and engagement with the wider University community such as acting as ambassadors, volunteering, peer mentoring, student representation, membership and leadership of clubs and societies). Our Graduate Attributes consist of four themes: **academic expertise, professional skills, personal effectiveness, and social and ethical awareness.** You will have opportunities to engage actively with the range of attributes throughout your time at Keele: through your academic studies, through self-assessing your own strengths, weaknesses, and development needs, and by setting personal development goals. You will have opportunities to discuss your progress in developing graduate attributes with, for example, Academic Mentors, to prepare for your future career and lives beyond Keele.

5. How is the programme taught?

The mode of delivery follows Keele's Strategic Vision for Education, using a tailored blended approach to online learning, mixing asynchronous and synchronous teaching sessions, with face-to-face delivery for the 2-week residential of intensive R&D practical work in the summer, robustly rooted with pre-and post-sessional webinars. The exact nature of the academic content of the R&D module will be defined, through questionnaires, by the prior knowledge that the learners will bring to the class. It will allow a bespoke learning experience embedded in group participation and engagement with the learners, but also with employers (e.g. involved in hosting work-based projects).

The programme is delivered through a variety of learning and teaching activities:

- Lectures, including those from external speakers.
- Workshops, run with small groups of students, mixing both taught and practical sessions.
- Oral presentations
- Poster presentations
- Group / team work
- Practical laboratory work
- Literature research tasks
- Directed reading
- Independent study
- Independent research project carried out in a work-place laboratory
- Use of e-learning / the Keele Learning Environment (KLE, Blackboard) and MS Teams
- One-on-one meetings /discussions with individual research supervisors

The teaching team is conscious that learners come to learning with their own knowledge, skills and behaviours shaped from their previous study and employment history. As such, **it is absolutely crucial to place the learners at the centre of the learning experience**, and the teaching team will make sure that within the taught components of the course, there is a strong focus on student-led learning and research (with support from teaching staff and engagement from employers) to help develop independent research skills and technical skills. All learners are expected to engage in independent study for the duration of the programme.

Achievements of the Stated Outcomes

Year 1 will focus not only on generic research skills such as academic writing, critical paper evaluations, reviewing literature, data analysis and presentation skills (alongside specific knowledge and skills in analytical or biomedical science or image processing, including focusing on methodology in their chosen area or work), but also on project design and leadership management, with an emphasis on self-development and that of others, as well as on how to work successfully in a regulated environment. This should adequately prepare the apprentice for their work-based project in Year 2.

In **Year 2**, the learner will continue to develop skills in research design and leadership management alongside undertaking the year-long work-based project. This project will allow learners to develop advanced research, practical and analytical skills, and provide an opportunity to work alongside industrial partners. This provides excellent project management training within the specialist area and allows a range of employability skills to be not only developed but also significantly enhanced. In addition, learners will develop and be able to apply those generic and specific skills obtained in Year 1 to the work place.

The lectures describe, explain and map out the academic content of modules as well as engendering and developing an enthusiasm for analytical or biomedical science. Through examples and case studies discussed in the lectures, students develop critical skills in reviewing ideas, principles and applications. Informal small group discussions, which provide occasional support to material discussed in lectures, and workshops, have a dual role: firstly, in enabling students to apply theoretical ideas to new problems and secondly, to allow the tutor to provide formative feedback on the students' learning during these activities.

The three specialisms on offer with this programme - Analytical Science, Biomedical Science or Specialist Data Processing- are either laboratory- or clinically-based disciplines and practical work is closely tied to the lectures thus enabling learners to gain competence and confidence in the investigation and analysis of materials/images, using (laboratory) instrumentation and methods, as well as developing a critical awareness of the range of

techniques/algorithms available, their capabilities and limitations. Students working on this programme quickly gain an understanding of health and safety issues, GDPR issues, manage risk assessments, maintaining accurate and informative practical notes and working with others in a safe and productive fashion.

In working with practical data, students develop skills and confidence in data analysis, the use of software tools and databases and in communicating the outcomes of such work in the form of reports, oral presentations and as a conference poster to a variety of audiences. They will also develop skills in working within small groups of various sizes in laboratory mini-projects.

By engaging in literature research tasks and through directed reading, students will advance their own understanding of the discipline, develop critical abilities, appreciate the limitations of information and assess the merits of contrasting theories, explanations and strategies. Through working on all assignments, learners will develop organisational skills, efficient working practices and the ability to meet appropriate deadlines.

Through project work, students will research, devise, plan, execute and report on an original investigation within the discipline either as an individual or as part of a team. They will work safely in the laboratory and engage in ethical, honest and acceptable practices throughout. The supervisor meetings will provide guidance and support throughout the project. Also, as a preparation to the project work, the student will be familiarised with the context of industrial marketing, competitiveness and cost-effective approaches.

Throughout the programme students will undertake independent study that will require them to develop an adaptable and flexible approach to study, work and work-life balance. They will need to work towards identified targets for their own academic development, take responsibility for their own learning and thereby develop confidence in their own understanding and acquire a self-critical attitude to their own work and achievements. Consequently, each student will develop practices which will enable them to engage with on-going professional development throughout their careers.

The Keele Learning Environment (KLE), alongside the use of the Microsoft Teams platform, will provide a virtual resource to support learning and teaching activities, enhance student development and provide a forum for the exchange of ideas and discussion of issues that may arise during programme delivery. This includes posting learning resources for the modules on which they teach; these include lecture notes, module and laboratory handbooks, problem sheets, web-links to external resources, assignment briefs, assignment feedback and in some cases quizzes. Many staff also use the KLE for electronic submission of work, marking and feedback.

6. Teaching Staff

The teaching and research staff that deliver and support the programme come from three different Schools across Keele University:

Keele Business School: https://www.keele.ac.uk/kbs/

School of Life Sciences: https://www.keele.ac.uk/lifesci/

School of Chemical & Physical Sciences: https://www.keele.ac.uk/scps/

There are additional guest lecturers from the industrial and business sectors. The academic staff from both the Faculty of Natural Sciences and the Faculty of Humanities and Social Sciences at Keele teaching on this programme have expertise and interests within the various aspects of the programme. Most academic staff are active researchers and many have a distinguished track record in publication, the generation of grant income, industrial collaborations and as research journal reviewers. Several staff have particular interests in the development of teaching and learning methods and some are members of, and active in, the professional bodies. A number of staff are Fellows of the Higher Education Academy, have held Keele Teaching and Learning Awards, and some have been awarded the University Teaching Excellence Award. Additionally, the majority of staff contribute to widening participation and science outreach activities, and have demonstrated innovation and good practice in teaching and learning to take into account the diverse needs of all students.

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?

Module structure and credits

The structure of the *MSc in Technical Leadership* programme is part-time and is shown below. It totals 180-

credits comprising six modules delivered over six semesters.

The programme comprises six modules: five running in year 1 and one spanning across year 2. The structure of the programme is designed to develop a sound understanding of analytical science techniques and methods, generic research skills (e.g. critical reading, thinking and reflective writing, scientific writing, scientific communication), along with specific research skills (such as laboratory methods and data analysis and interpretation). However, it also encompasses project design, management and leadership skills, within the perspective of a professional setting. The learner develops these skills in year 1 before starting their work-based project in year 2.

In the first year, the student will learn about how to manage Project and Processes in the context of a laboratory environment, with both the Business School and scientists from the Faculty of Natural Sciences as well as 21st century techniques of Research Communication, whether to a lay audience or to a scientific community. The teaching staff will take the learner through techniques of Data Analysis to extract confidently the important scientific information off the project work. Through a 2-week residential, the Research & Development module will teach the learner about the latest on their topic of interest, designed to give hands-on experience on key laboratory techniques. Finally, the student will learn about Leading Teams with the Business School at Keele. The 2nd year is devoted to a work-place project which will allow the learner to plan and execute a laboratory research project with confidence and independence and act autonomously in planning and implementing tasks at a professional or equivalent level, with support from the placement provider but also from an academic supervisor providing advice on all academic aspects of the project.

Programme structure diagram - September Intake

Project & Processes (MAN-40160)	30 credits, Sem 1	KBS	1-day synchronous teaching + online delivery
Leading Teams (MAN-40158)	30 credits, Sem 2	KBS	1-day synchronous teaching + online delivery
Research Communication (CHE-40044)	15 credits, Sem 2	SCPS	1-day synchronous teaching + online delivery
Data Analysis (PHY-40029)	15 credits, Sem 3	SCPS	1-day synchronous teaching + online delivery
Research and Development in Analytical Sciences (CHE-40042) OR Research and Development in Biomedical Sciences (LSC-40069) OR Research & Development in Specialist Data Processing (CHE-40060)	30 credits, Sem 3	SCPS or LS	2-weeks face-to-face + online delivery
Work-Based Project (CHE-40046)	60 credits in Year 2 Sem 1, 2, 3	SCPS	in workplace + online delivery
End Point Assessment *(Research Scientist Apprenticeship)*	Year 3 (within 3 months)	EPAO	Assessment method 1: Project report, presentation and questioning Assessment method 2: Professional discussion underpinned by portfolio of evidence

Programme structure diagram - January Intake

Leading Teams (MAN-40158)	30 credits, Sem 2	KBS	1-day synchronous teaching + online delivery
Research Communication (CHE-40044)	15 credits, Sem 2	SCPS	1-day synchronous teaching + online delivery
Data Analysis (PHY-40029)	15 credits, Sem 3	SCPS	1-day synchronous teaching + online delivery
Research and Development in Analytical Sciences (CHE-40042) OR Research and Development in Biomedical Sciences (LSC-40069) OR Research & Development in Specialist Data Processing (CHE-40060)	30 credits, Sem 3	SCPS or LS	2-weeks face-to-face + online delivery
Project & Processes (MAN-40160)	30 credits, Sem 1	KBS	1-day synchronous teaching + online delivery
Work-Based Project (CHE-40046)	60 credits in Year 2 Sem 2, 3, 1	SCPS	in workplace + online delivery
End Point Assessment *(Research Scientist Apprenticeship)*	Year 3 (within 3 months)	EPAO	Assessment method 1: Project report, presentation and questioning Assessment method 2: Professional discussion underpinned by portfolio of evidence

The End Point Assessment (EPA) is a requirement of completion for all apprenticeships and is an independent synoptic assessment to determine that the apprentice meets the competency requirements of the Research Scientist apprentices. The End Point Assessment will be delivered by an independent End Point Assessment Organisation (EPAO).

The EPA for the Research Scientist Apprenticeship takes place at the point of completion of the MSc Technical Leadership (as the qualification which is mapped to deliver the requirements of the standard and the employer is satisfied the apprentice is consistently working at, or above, the level of the occupational standard). Apprentices must have compiled a portfolio of evidence.

The EPA comprises the below three assessment methods and is assessed a fail, pass or distinction. This will be recognised on the Certificate of Apprenticeship and bears no relationship to the grade awarded through the MSc Technical Leadership. The Research Scientist Apprenticeship Assessment Plan provides full details of the assessment methods and requirements:

https://www.instituteforapprenticeships.org/media/2917/st0759_research-scientist_l7_-for-publication_revision_110419.pdf

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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

Subject Specific Skills	
Learning Outcome	**Module in which this is delivered**
Firstly, the breadth and substance of the science strand (analytical, biomedical or image processing) and its applications spanning across various disciplines (chemistry, environmental science or biochemistry, biomedical science or medical physics for example) and then the knowledge and understanding of numerous specific techniques (e.g. mass-spectrometry or deep learning), and this embedded in the understanding of leadership and management skills in a 21st century organisation.	all modules but more specifically the R&D module: either CHE-40042, LSC-40069 or CHE-40060.
Secondly, the extended research training which takes place in the workplace, requires the knowledge and broad understanding of key concepts of the organisation in which the project takes place, as well as technical knowledge.	CHE-40046 as well as MAN-40158 and MAN-40160. Plus PHY-40029 and CHE-40044.

Key or Transferable Skills (graduate attributes)	
Learning Outcome	**Module in which this is delivered**
1. Understand and handle scientific literature relevant to their chosen research area and introduce the processes of research planning through the development of a detailed research proposal.	All modules
2. Engage with and carry out a variety of science communication activities and select appropriate means for a specific audience, such as presenting at conferences, academic writing, outreach activities.	All modules
3. Audit their personal research skills and act upon the outcomes to enhance these skills and subsequently tackle and solve problems with confidence and independence, and act autonomously in planning and implementing tasks at a professional or equivalent level.	All modules
4. Competently plan, organise and manage a programme of independent experimental work, and to demonstrate self-direction, dedication and originality to independent learning.	All modules
5. Understand the need to comply with local health and safety rules, and the necessity for risk assessment and the health and safety issues relevant to the laboratory research work.	All modules
6. Promote an integrated approach to theoretical knowledge, understanding and practical implications of the scientific work alongside personal thoughts and experiences, and show originality in the application of new knowledge.	All modules

8. Final and intermediate awards

In undertaking apprenticeship training, the employer and apprentice are committing to undertaking the whole apprenticeship, comprising the MSc Technical Leadership and the Research Scientist independent End Point Assessment. Apprenticeships are not intended as a route to intermediate award.

The award is separate from the End-Point assessment but the End-Point assessment must be passed in order to meet the requirements of the apprenticeship.

Master's Degree	You will require 180 credits at Level 7
Postgraduate Diploma	You will require 120 credits at Level 7
Postgraduate Certificate	You will require 60 credits at Level 7

9. Learning Outcomes and Assessments

The Mapping of the Knowledge, Skills, Behaviours as given in the Standard of the Research Scientist Apprenticeship (May 2019) against the modules and assessments of the MSc in Technical Leadership are given below to illustrate the distinctive nature of this programme in the UK Higher Education Sector. Indeed, the programme title encompasses this distinctive conjunction of management for technical science:

Link to Learning Outcomes: Knowledge

Link to Learning Outcomes: Skills

Link to Learning Outcomes: Behaviours

How is the programme assessed?

Function of the methods of assessment in testing the achievement of stated programme learning outcomes

This programme's varied assessment strategy ensures the student develops a sound understanding of analytical and biomedical methods as well as employability and the research and academic skills appropriate for a professional setting. The assessment design is based on several key principles which promote independent learning, student autonomy and responsibility for personal learning and the development of innovation and originality within Analytical or Biomedical Science or Specialist Data Processing.

The specificity of the programme is to work with apprentices who are acquiring Knowledge, Skills and Behaviours to be applied in their workplace. As such, employers will be encouraged to help with the evaluation of such learnings, for all modules, through supporting both the on-the-job application of the learning and the assessment of completion of learning outcomes during tripartite meetings.

For example, reflection is a key aspect of learning and in all modules but one,each learner produces a Reflective Portfolio of taught sessions and appraises their skills through a skills audit, identifying areas where to apply their newly acquired skills. The Reflective Portfolio promotes an integrated approach to theoretical knowledge, understanding and practical implications of students work alongside the student's personal thoughts and experiences. It feeds into employability skills as reflection is the key tool employed by practicing professionals to evidence the student's professional development. The Reflective Portfolio is an integral part of the programme and strongly linked to the other modules. It will draw from these five modules in key management and leadership skills of Analytical or Biomedical Science or (medical) Image Processing. It will also touch upon personal development for the enhancement of research skills through the VITAE scheme (https://www.vitae.ac.uk/), so as to increase employability potential for further career development.

The Literature Review requires students to critically appraise current literature and integrate their new knowledge into a structured, logical review of the field. This will develop the student's information literacy and skills in searching for, selecting and critically evaluating peer-reviewed research literature relevant to their MSc work-based project report, and then synthesising this information into a literature review. Indeed, selecting and reviewing literature and being able to critique information are important skills in ensuring that scientific and business decisions are based on strong science. Feedback will be given via regular seminar/tutorial meetings with the project supervisor helping to develop the student's confidence in discussing and critiquing science and scientific issues.

Oral Presentations, Video Presentations and Poster Presentations demonstrate the ability of the student to present complex concepts and information in a clear and concise manner, to interact and communicate effectively to a wide range of professional environments, including to both scientific and non-scientific audiences.

The Work-based Project Report enables the learner to demonstrate their effective engagement with the research literature across analytical or biomedical science and use it to advance their understanding. In this way, the assessment may test their awareness of, and engagement with, current methods and techniques within analytical / biomedical sciences / data processing some of which are at, or informed by, the forefront of the discipline. The assessment enables the learner to present complex concepts and information in a clear and concise manner in writing, and to communicate effectively to a wide range of scientific and professional environments. It demonstrates how the student has taken responsibility for their own learning, has critically

assessed a wide range of techniques and methodologies relevant to analytical / biomedical sciences or medical physics & clinical engineering and used them competently to analyse relevant (bio)materials or clinical images. It also ensures that the learner has selected and utilised appropriate software, databases and other digital resources for the analysis and interpretation of practical data.

The Employer's and Provider's evaluations assess the apprentice's skills in working both independently and as part of a team, in planning, organising and carrying out practical and other work efficiently, including making appropriate ethical assessments, and meeting appropriate deadlines. This is also discussed during the regular tripartite review meetings, 3 to 4 times a year.

Research design and project management are key skills in both academia and industry. The Finances of Processes in "MAN-40160: Project & Processes" as well as the Evaluation of the Societal Impact of the proposed project as developed in "CHE-40044: Research Communication", identifying any key beneficiaries and potential sources of funding, involves an element of reflection along with time management and strategizing of a project. This will introduce the learner to the level of detail and research process needed to successfully compete for funding, whether it be for academia or for industry.

The Context of Competitiveness from the module "MAN-40160: Project & Processes"will enable students (i) to discover key aspects of market-driven science, (ii) to place their newly acquired knowledge within the context of their own project. Indeed, they will ultimately be able to assess which industry(ies) is or could be interested in such a scientific piece of work. The ability to assess who are the main industrial competitors within a given area of analytical/biomedical science will create new opportunities for the students to deepen their sector understanding and enhance awareness of progression opportunities.

Data Analyses either based on experimental data collected by the student themselves (in the modules "CHE-40042/LSC-40069/CHE-40060: R&D" and "CHE-40046: Work-based Project") or given as papers to the student (in the module "PHY-40029: Data Analysis") will enable the learner to analyse relevant materials or images and select and utilise appropriate software, databases and other digital resources for the analysis and interpretation of practical data. These assessments enable the students to present complex concepts and information in a clear and concise manner in writing, and to communicate effectively to a wide range of scientific and professional environments.

Critical Evaluation of Techniques or Methods of choice in the modules "CHE-40042 or LSC-40069 or CHE-40060: R&D" and "CHE-40046: Work-based Project"will demonstrate how the student has taken responsibility for their own learning, has critically assessed a wide range of techniques and methodologies relevant to their specific specialism of study to set-up a profile for the given techniques including precision, resolution, type of specimens used, costs associated with the techniques or methods. Such knowledge will be used competently to compare the techniques against one another (advantages / disadvantages) and allow the student to develop a critical awareness as to what given methods might be more appropriate within a professional setting.

A full assessment brief is provided within each module handbook. All summative forms of assessment are fully supported by a variety of formative assessment/feedback activities and academic guidance.

Students supported through formative (i.e. non-mark-bearing) assessment

Although there are some explicit formal exercises providing formative assessment throughout the programme, the majority of formative assessment and feedback is generated informally through a variety of tutor-led activities. For example:

- Tutor-led comments on the work in the laboratory notebook or on calculations encountered in data analysis during laboratory classes
- Tutor feedback and advice on calculations undertaken during problems classes
- Tutor-led discussions on project plans, literature reviews and project results
- Written formative feedback on non-summative laboratory work
- Written formative feedback provided from the tutor reading a draft of a major piece of work such as the dissertation or a project report

End-Point Assessment

As well as containing in-programme training and assessment, the apprenticeship has an end-point assessment (EPA). All apprentices must undertake this independent assessment, which is a synoptic assessment of the knowledge, skills and behaviours that have been learnt throughout the apprenticeship. The purpose of the assessment is to make sure the apprentice meets the standard set by employers and are fully competent in the occupation. It is taken by apprentices at the very end of the on-programme phase of training when their employer (and in some cases their training provider) is satisfied that they have met the "gateway" criteria. The University will confirm at an Award Board which students have met the gateway criteria.

The End Point Assessment (EPA) is a requirement of completion for all apprenticeships and is an independent assessment to determine that the apprentice meets the competency requirements of the apprenticeship standard. The End Point Assessment will be delivered by an independent End Point Assessment Organisation

(EPAO).

10. Accreditation

The Royal Society of Biology, the Institute of Physics and the Royal Society of Chemistry have provided an expedited route for individuals to achieve Chartered status (Chartered Biologist, Chartered Chemist or Chartered Physicist) through this apprenticeship, as the apprenticeship is closely aligned to a number of the Chartered status competencies/attributes

In order to be considered for Chartered status individuals must have a relevant degree or equivalence at the start of the apprenticeship, and must inform the relevant professional body upon commencement of the apprenticeship of their intention to apply for Chartered status.

The apprenticeship programme in Analytical Science has been accredited by the Royal Society of Chemistry.

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?

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.

It is expected that applicants will fulfil the conditions as given by the apprenticeship route:

- Must be in a role that has employer support.
- Hold a first degree which justifies the learning of analytical science or biomedical science or image processing, e.g. chemistry, forensic science, biochemistry, biology, radiography, computing science, physics (where applicants can demonstrate substantial and relevant analytical / biomedical / data processing experience formal qualifications may be waived).
- Minimum of 2 years' relevant experience in the analytical / biomedical / medical physics-engineering sector
- We usually require that GCSE Maths and English Grade 4 (C) or equivalent qualification is attained by the start of the apprenticeship.

We normally require applicants to evidence the above qualifications before starting the apprenticeship. Applications are welcomed from those with qualifications equivalent to the above. 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: https://www.keele.ac.uk/qa/programmesandmodules/recognitionofpriorlearning/

13. How are apprentices supported on the programme?

The Programme Lead will be responsible for the programme and will hold an introductory session towards the beginning of the programme to provide general guidance and advice on programme delivery and lines of accountability and student support. The Programme Lead will also be available either directly (through appointments) or indirectly via email or KLE / Teams discussion boards for advice on specific problems students may encounter at any point throughout the programme.

Module leaders are available either directly or indirectly via email for module-specific problems. One-to-one meetings can be arranged as necessary for student consultation. It is the responsibility of module leaders to ensure that appropriate feedback is provided to all students regarding both formative and summative assessment. They will ensure that such feedback is of a high quality and delivered in a timely fashion.

Each learner will be appointed a named Academic Mentor from the academic teaching team for pastoral and

academic guidance. Academic Mentors will meet their students as a group during programme induction and will be available for additional one-to-one consultations as required by the student and will be contactable by email or telephone. Academic Mentor will also introduce and promote the University's Personal Development Planning system to further promote and develop student learning. In addition, there will be an independent advisor available to liaise with students, either as a group or individually, on any aspect of the programme or personal development.

Individual Academic Project Supervisors will provide additional academic guidance on research-related issues. A work-based supervisor will be appointed at that workplace. Guidelines are available to ensure that there is appropriate interaction between the learner, the project and academic supervisors, and the learner will remain in contact with their Keele academic supervisor throughout the course of the project.

All learners are entitled and encouraged to make use of all central university services, including the Keele Postgraduate Association.

The learner cohort will also be represented on the Student Staff Voice Committee (SSVC) and they will be eligible to represent the taught Postgraduate (PGT) students on the School of Chemical and Physical Sciences Education Committee, if elected to do so by their peers.

As the MSc Technical Leadership is the academic programme delivering the Research Scientist Apprenticeship, programme delivery is embedded in apprenticeship requirements. Apprentices will be supported by the following:

- At programme application, apprentices will undertake an Initial Needs Assessment (INA) delivered through the Skills Scan function in Aptem (our end to end system for apprenticeship application and compliance). This enables us to identify each apprentice's start point against the requirements of the apprenticeship standard. Regular use of the Skills Scan can identify distance travelled and any additional learning requirements to meet the requirements of synoptic End Point Assessment.
- Requirements of Apprenticeship for all parties are set out prior to commencement through the Commitment Statement: a tripartite agreement containing responsibilities, key policies and contacts and the individual learning plan.
- Regular Tripartite Review Meetings (at least 3 per year) between apprentice, training provider and employer enable all parties to ensure that the requirements of apprenticeship and development progress are reviewed from both the delivery of theory and skills and competency through application in the workplace.
- Following completion of training and agreement by all parties that the apprentice is ready to complete (Gateway) then the End Point Assessment period may commence.
- The training provider will work with the employer to select an End Point Assessment Organisation for the apprenticeship standard. The EPAO typically also provides additional support to prepare for End Point Assessment.

At your workplace, you will be supported by your employer. Exact arrangements and terminology are the responsibility of the employer but typically, you will have a named contact person who manages the relationship between the programme and the employer. The University and the employer are bound by contract to work together to support you as an apprentice. This will include 3-4 tripartite review meetings between the University, the apprentice, and the employer.

If your employment circumstances change whilst you are on the programme; support can be accessed from the University's Careers and Employability Service.

14. Learning Resources

The programmes will be taught (when possible) in modern teaching rooms across the University which are equipped with computers, internet access and projection equipment. Otherwise, students will take advantage of Microsoft Teams to access synchronous and asynchronous teaching sessions, organised in breakout rooms for small group activities when required.

Practical research training in either the "CHE-40042: R&D in Analytical Science" or "LSC-40069: R&D in Biomedical Science" or "CHE-40060: R&D in Specialist Data Processing" module will be undertaken in appropriate teaching and research laboratories within the School of Chemical and Physical Sciences, the School of Life Sciences or the School of Computer Science & Mathematics respectively.

Individual module handbooks will provide a recommended reading list, which comprise a range of electronic multi-media resources that will be accessed through KLE / MS Teams. Discussion boards available on KLE / Teams may also be used to enhance student the student experience, learning and support during the period of engagement and provide a forum for the exchange of ideas and discussion of issues that arise.

The programme will be supported by a number of guest speakers working within the three specialisms on offer, who will give (online) presentations at research group meetings, School meetings, appropriate research Faculty meetings or society meetings. Apprentices are encouraged to make full use of the opportunities these activities present by engaging with the professionals or contacting them later through email to answer any questions they

may have on their particular area of expertise or general career advice.

The analytical and biomedical laboratories in the School of Chemical & Physical Sciences as well as in the School of Life Sciences are fully equipped with multiple sets of FTIR spectrometers, UV-VIS spectrometers, fluorescence spectrometers, HPLC and GC-MS instrumentation, an NMR spectrometer (with probes for both solid- and liquid-state), an Inductively-Coupled Plasma Optical Emission Spectrometer (ICP-OES), and Raman microscope or biochemistry, immunology, haematology and transfusion science instrumentation. *MSc in Technical Leadership* learners also have access to XRD (powder and single crystal diffraction), XRF and a scanning electron microscope (with EDX analysis) but also a range of electron microscopes (SEM and TEM) within the Faculty. The School of Computer Science & Mathematics offers many computer facilities and that includes their own Makerspace with Raspberry PIs, Arduinos and dedicated PCs; they provide various web servers as well as a cloud computing facility for student use. They also host a CUDA GPU supercomputer Cluster for use across campus. Furthermore, further specialised instrumentation can be found within the research laboratories either at Keele University or within the premises of the industrial partners.

The Library has many resources for Analytical / Biomedical Science and Image Processing with Deep Learning, both on campus and online. Further information about the library can be found at: https://www.keele.ac.uk/library/. To access online library services off campus apprentices will need their Keele e-mail address. Students will be encouraged to build a research profile on professional sites, which are useful networking tools and sources of published peer-reviewed literature.

Learners will have access to IT Services who are responsible for the support of all staff and students undertaking academic computing tasks.

15. Other Learning Opportunities

Apprentices can opt, or be recommended by their academic supervisor (where practical and possible), to attend lectures, seminars and practical sessions on appropriate Analytical / Biomedical Science modules on an informal basis in addition to the modules they are taking for their degree. This may be useful for further developing key skills in their area of Analytical / Biomedical Science / Specialist Data Processing.

The tripartite process may identify additional opportunities for development which will be discussed as part of the tripartite review process.

16. Additional Costs

Tuition fees are paid by your employer but you may incur costs not covered by the mandatory components of the apprenticeship e.g. library fines, print costs and costs associated with graduation.

Additionally, accommodation costs may be incurred for the 2-week residential scheduled in the summer. There is an expectation that such costs are covered by the employer. When we can, we will endeavour to provide student accommodation for this residential.

Certification for non-mandatory awards may require students to pay a fee.

These costs have been forecast by the University as accurately as possible but may be subject to change as a result of factors outside of our control (for example, increase in costs for external services). Forecast costs are reviewed on an annual basis to ensure they remain representative. Where additional costs are in direct control of the University we will ensure increases do not exceed 5%.

17. Quality management and enhancement

The Institute for Apprenticeships and Technical Education (IfATE) provides External Quality Assurance (EQA) for the Research Scientist Apprenticeship, for which the MSc Technical Leadership delivers off the job learning. The EQA Framework monitors the quality of the End Point Assessment, which is the standardised synoptic assessment required to complete the apprenticeship. Further information about EQA can be found via the IfATE website: https://www.instituteforapprenticeships.org/quality/external-quality-assurance/

IfATE outline their expectations of quality apprenticeship in their Quality Statement, which makes clear the expectations of stakeholders in training: https://www.instituteforapprenticeships.org/quality/what-is-a-quality-apprenticeship/

Ofsted holds responsibility for inspecting the quality of apprenticeship provision.

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 Revalidation process.

The School of Chemical & Physical Sciences currently holds a Bronze Athena Swan award - the Athena Swan Charter (https://www.ecu.ac.uk/equality-charters/athena-swan/) promotes best practice in academia in terms of life/work balance and promotes the support of women in STEM subjects. Some of the staff teaching on the *MSc in Technical Leadership* programme are members of the School Athena Swan committee.

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/qa/externalexaminers/currentexternalexaminers/

18. The principles of programme design

The MSc Technical Leadership programme builds from the successful industrial collaborations between Keele University and several national or international industries. The associations developed provide an excellent framework in which to train students in those generic and science specific skills that would increase their employability (promotion and development chances) in the area of research and/or industry. In addition, it gives learners an opportunity to contribute to the further development of the collaborative links between Keele and its industrial partners.

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. QAA Subject Benchmark Statements: Chemistry (2022) https://www.qaa.ac.uk/quality-code/subject-benchmark-statements/chemistry

Master's degrees in Business and Management (2023) https://www.qaa.ac.uk/docs/qaa/sbs/sbs-business-and-management-23.pdf?sfvrsn=8370a881_10

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

d. Apprenticeship Standard for Research Scientist: https://www.instituteforapprenticeships.org/apprenticeship-standards/research-scientist-v1-0

19. Annex - Programme-specific regulations

Programme Regulations: MSc Technical Leadership

Final Award and Award Titles	MSc Technical Leadership with specialism in Analytical Science MSc Technical Leadership with specialism in Biomedical Science MSc Technical Leadership with speacilism in Specialist Data Processing
Intermediate Award(s)	Postgraduate Diploma Postgraduate Certificate
Last modified	Dec 2023
Programme Specification	https://www.keele.ac.uk/qa/programmespecifications

The University's Academic Regulations which can be found on the Keele University website (https://www.keele.ac.uk/regulations/)[1] apply to and regulate the programme, other than in instances where the specific programme regulations listed below over-ride them. These programme regulations list:

- *Exemptions* which are characterised by the omission of the relevant regulation.
- *Variations* which are characterised by the replacement of part of the regulation with alternative wording.
- *Additional Requirements* which set out what additional rules that apply to students in relation to this programme.

The following **exemptions, variations** and **additional requirements** to the University regulations have been checked by Academic Services and have been approved by the Faculty Education Committee.

A) EXEMPTIONS

The clause(s) listed below describe where an exemption from the University's Academic Regulations exists:

For the whole duration of their studies, students on this Programme are exempt from the following regulations:

- **No exemptions apply.**

B) VARIATIONS

The clause(s) listed below describe where a variation from the University's Academic Regulations exists:

No variations apply

Additional Requirements

The programme requirements listed below are in addition to the University's Academic Regulations:

Additional requirement 1: Specific attendance requirements and sanctions for failure to meet them

Attendance will be monitored. If there is a valid reason for not attending a synchronous/in-situ teaching session then the School Office should be notified as soon as possible. Continued absence from any class or classes is taken very seriously by the University and it may result in a student being withdrawn from the University.

All **laboratory classes** in the MSc in Technical Leardership programme are **compulsory** since all involve the completion of work which will contribute to your assessment. The laboratory classes will take place as a

residential over two weeks in July 2024, following the required H&S guidelines in place then. The Course Director should be informed of an absence for any length of time. If it is necessary to request permission formally for a period of absence, then details on this are available at: https://www.keele.ac.uk/regulations/regulationb4/

The student must show appropriate engagement with the studies as described in **Regulation C 7** of a Masters degree (see link below). https://www.keele.ac.uk/regulations/regulationc7/

Appropriate engagement with studies is particularly true for the "CHE-40046 Work-Based Project" module, which require full attendance and engagement from the learner during the year long research placement. Failure to do so would be reported by the project supervisor to the academic supervisor who would then contact the Course Director. The Director would act upon that situation according to the regulation given above. Engagement in the project modules is learner-centred and learner-led with support provided throughout by the supervisors. Learners will be assigned an academic supervisor once they register on the "*CHE-40046 Work-based Project*" module, and this academic supervisor will work with them, and with others in the supervisory team, throughout the course of the research placement experience to ensure that they are fully supported before and during their placement.

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[1] References to University Regulations in this document apply to the content of the University's Regulatory Framework as set out on the University website here https://www.keele.ac.uk/regulations/.

Version History

This document

Date Approved: 10 June 2024

Previous documents

Version No	Year	Owner	Date Approved	Summary of and rationale for changes
1	2023/24	CHRYSTELLE EGGER	17 April 2023	
1	2022/23	CHRYSTELLE EGGER	23 August 2022	