# Programme Specification: Undergraduate

# For Academic Year 2025/26

## 1. Course Summary

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| **Names of programme and award title(s)** | BSc (Hons) Data Science<br>BSc (Hons) Data Science with International Year (see Annex for details)<br>BSc (Hons) Data Science with Work Placement Year (see Annex for details) |
| **Award type** | Single Honours |
| **Mode of study** | Full-time |
| **Framework of Higher Education Qualification (FHEQ) level of final award** | Level 6 |
| **Normal length of the programme** | 3 years; 4 years with either the International Year or Placement Year between years 2 and 3 |
| **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) |
| **Tuition Fees** | **UK students:**<br>Fee for 2025/26 is £9,535*<br>**International students:**<br>Fee for 2025/26 is £17,700**<br>The fee for the international year abroad is calculated at 15% of the standard year fee<br>The fee for the work placement year is calculated at 20% of the standard year fee |

> ***Please note this document applies to Level 5 (Year 2) students only in 2026/27. Students in other years should refer to alternative documents.***

***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.*

** These fees are regulated by Government. We reserve the right to increase fees in subsequent years of study in response to changes in government policy and/or changes to the law. If permitted by such change in policy or law, we may increase your fees by an inflationary amount or such other measure as required by government policy or the law. Please refer to the accompanying Student Terms & Conditions. Further information on fees can be found at http://www.keele.ac.uk/studentfunding/tuitionfees/*

*** These fees are for new students. We reserve the right to increase fees in subsequent years of study by an*

*inflationary amount. Please refer to the accompanying Student Terms & Conditions for full details. Further information on fees can be found at [http://www.keele.ac.uk/studentfunding/tuitionfees/](http://www.keele.ac.uk/studentfunding/tuitionfees/)*

## 2. What is a Single Honours programme?

The Single Honours programme described in this document allows you to focus more or less exclusively on this subject. In keeping with Keele's commitment to breadth in the curriculum, the programme also gives you the opportunity to take some modules in other disciplines and in modern foreign languages as part of a 360-credit Honours degree. Thus it enables you to gain, and be able to demonstrate, a distinctive range of graduate attributes.

## 3. Overview of the Programme

With the increasing reliance on data-driven decision making across industries, data scientists are in high demand. Our industry-informed BSc blends theoretical foundations with practical experience to equip you with the statistical knowledge, technical, problem-solving, computational and communication skills to implement an ethical approach to analysing real-world data and creating visualisations to effectively communicate your findings.

This programme provides you with a unique blend of sound mathematical and computational skills, including statistical techniques combined with extensive use of AI and machine learning, required to thrive within the rapidly expanding area of Data Science. Data driven systems are now vital to business, government, science and society, and there is an increasing demand for graduates with required practical skills able to implement an ethical and well-organised approach to analysis of real-world data, present its visualisations and explain the associated business implications.

The programme builds on the previous knowledge of Mathematics and assumes no prior experience of computer programming. You will start your degree by exploring the theoretical underpinnings of the data science discipline, providing a solid foundation in mathematics, statistics and programming, along with a strong emphasis on practical skills of data analyst. This focus will become even more pronounced with your progress along the programme, when studying various aspects of AI and machine learning, ethical handling of data, as well as developing presentation, communication and visualisation skills, and reaching the culmination within the final year project. A variety of optional modules provides broad insights into cybersecurity, cryptography and medical statistics. The programme also benefits from industry links, e.g. guest lectures, and contains a significant placement offering.

## 4. Aims of the programme

The broad aims of the programme are to:

- Develop your intellectual, practical and additional transferable skills, to enable you to gain a sound academic background in Data Science and relevant aspects of Computer Science and Mathematics.
- Develop the required professional skills of a data scientist, including technical, problem-solving and communication skills.
- Acquire knowledge from the forefront of Data Science, as informed by subject research, discipline and industry trends and market requirements.

## 5. 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 knowledge and understanding
- Subject specific skills
- Key and transferable skills (including employability skills)

### Subject knowledge and understanding

Successful students will be able to demonstrate knowledge and understanding of:

- the context of data science area in relation to computer science, mathematics, statistics and software engineering;
- the science of data investigation and data visualisation and the applications of statistics to data analysis;
- the relevant mathematical concepts and techniques;
- probability-based models, hypothesis testing, statistical inference and likelihood;
- handling data within the context of data governance, data security, and communications;
- applications of data science to improve an organisation's processes, operations and outputs;
- the context of professional, economic, social, environmental, moral and ethical considerations involved in

data analysis;
- systematic data handling, through an awareness of key platforms for data and analysis in an organisation, including data processing/storage and database systems;
- designing, implementing and optimising analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods, advanced and predictive analytics, machine learning and artificial intelligence techniques, simulations, optimisation, and automation;
- the computational and organisational resource constraints and trade-offs involved in selecting models, algorithms and tools;
- development standards, including programming practice, testing, source control;
- the data landscape, involving critical analysis and interpretation of complex information from diverse dataset, as well as data formats, structures and data delivery methods including "unstructured" data, observing common patterns in real-world data.

**Subject specific skills**

Successful students will be able to:

- Identify appropriate problems an organisation faces and reformulate them into data science problems. Devise solutions and make decisions in context by seeking feedback from stakeholders. Apply scientific methods through experiment design, measurement, hypothesis testing and delivery of results. Collaborate with colleagues to gather requirements.
- Perform data engineering: create and handle datasets for analysis. Use tools and techniques to source, access, explore, profile, pipeline, combine, transform and store data, and apply governance (quality control, security, privacy) to data.
- Identify and use an appropriate range of programming languages and mathematical tools for data manipulation, analysis, visualisation, and system integration. Select appropriate data structures and algorithms for the problem. Develop reproducible analysis and robust code, working in accordance with software development standards, including security, accessibility, code quality and version control.
- Design, implement and optimise analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods.
- Use analysis and models to inform and improve organisational outcomes, building models and validating results with statistical testing: perform statistical analysis, correlation vs causation, feature selection and engineering, machine learning, optimisation, and simulations, using the appropriate techniques for the problem.
- Implement data solutions, using relevant software engineering architectures and design patterns. Evaluate cloud vs. on premise deployment. Determine the implicit and explicit value of data. Assess value for money and return on investment. Scale a system up/out. Evaluate emerging trends and new approaches. Compare the pros and cons of software applications and techniques.
- Find, present, communicate and disseminate outputs effectively and with high impact through creative storytelling, tailoring the message for the audience. Use the best medium for each audience, such as technical writing, reporting and dashboards. Visualise data to tell compelling and actionable narratives. Make recommendations to decision makers to contribute towards the achievement of organisation goals.
- Develop and maintain collaborative relationships at strategic and operational levels, using methods of organisational empathy (human, organisation and technical) and build relationships through active listening and trust development.
- Use project delivery techniques and tools appropriate to their data science project and organisation. Plan, organise and manage resources to successfully run a small data science project, achieve organisational goals and enable effective change.

**Key or transferable skills (including employability skills)**

Successful students will be able to:

- follow an inquisitive approach and have the curiosity to explore new questions, opportunities, data, and techniques along with tenacity to improve methods and maximise insights and relentless creativity in their approach to solutions.
- demonstrate empathy and positive engagement to enable working and collaborating in multi-disciplinary teams, championing and highlighting ethics and diversity in data work.
- show adaptability and dynamism when responding to varied tasks and organisational timescales, and pragmatism in the face of real-world scenarios.
- demonstrate problem-solving skills in the context of organisation goals.
- follow an impartial, scientific, hypothesis-driven approach to work, rigorous data analysis methods, and integrity in presenting data and conclusions in a truthful and appropriate manner.
- have commitment to keeping up to date with current thinking and maintaining personal development. Including collaborating with the data science community.
- construct well-argued and grammatically correct documents, locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed.
- recognise factors in environmental and societal contexts relating to the opportunities and challenges created by data analytics and computing systems across a range of human activities.

- apply academic theory learnt as part of the taught degree to real-world scenarios.
- Reflect on their study activities and experiences and evaluate their learning in the context of the real world.
- Explain how the professional data science and analytics sector operates and identify the skills required to pursue careers within the sector.

**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, environmental and ethical responsibility.** 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.

## 6. 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:

- **Traditional lectures** providing students with detailed notes, often supported by copies of lecture slides in print or electronic form.
- **Practical sessions** in computer laboratories often supported by copies of laboratory instruction sheets.
- **Web-based learning** using the University's virtual learning environment (KLE).
- **Tutorials** and **directed reading** on specific topics under the supervision of a member of academic staff.
- **Group project sessions** in which students develop a design for a software item to a level sufficient to allow implementation to follow.

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 Academic 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:

- Lectures allow students to gain a systematic knowledge and understanding of data science concepts and ideas and how to apply them to the development of software and information systems.
- Web-based learning and directed reading allow students to develop their interest in data science, their ability to reflect on their own learning and to take responsibility for its development.
- Group sessions enable students to develop their written and oral communication skills.
- Practical sessions and group work encourages students to work both independently and in collaboration with others as well as enabling them to solve problems in new or unfamiliar environments.

## 7. Teaching Staff

The Data Science academic staff is comprised of Professors, Readers, Senior Lecturers and Lecturers, most of which are active in research and also hold teaching qualifications.. Some of the staff on the programme have relevant industry links and will be employing these to benefit the programme delivery. Teaching will also involve demonstrators and session teachers who have significant experience in data science and computer science research and delivering practicals to data science and/or computer science students. More information about the Data Science staff is available at http://www.keele.ac.uk/scm/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.

## 8. What is the structure of the Programme?

The academic year runs from September to June and is divided into two semesters. The number of weeks of teaching will vary from programme to programme, but you can generally expect to attend scheduled teaching sessions between the end of September and mid-December, and from mid-January to the end of April. 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.

There are two types of module delivered as part of your programme. They are:

- Compulsory modules - a module that you are required to study on this course;
- Optional modules - these allow you some limited choice of what to study from a list of modules;

**Global Challenge Pathways**

This programme includes the option for you to take a Global Challenge Pathway. These modules offer you an exciting opportunity to work with students and staff from different disciplines to explore topical global issues such as power and conflict, health inequalities, climate change, generative AI, social justice, global citizenship, and enterprise from different perspectives.

Global Challenge Pathways can be taken as one 15-credit module at Levels 5 and 6. For more information about our Global Challenge Pathways please visit:
https://www.keele.ac.uk/study/undergraduate/globalchallengepathways/

**Modern Languages or Certificate in TESOL**

Alternatively, you could choose to study modules with the University Language Centre. The Language Centre offers three pathways; The Language Specialist, The Language Taster, and The Trinity Certificate in Teaching English to Speakers of Other Language (TESOL). Language Centre modules are available separately for students at Levels 4 and 5. At Level 6 they are included within the Global Challenge Pathways.

If you choose the Language Specialist pathway, you will automatically be enrolled on a Semester 2 Modern Language module as a continuation of your language of choice as a faculty funded 'additional' module. Undertaking a Modern Languages module in Semester 2 is compulsory if you wish to continue to the Language Specialist Global Challenge Pathway the following academic year.

For more information about Language Centre option modules available to you please visit the following webpages.

For Level 4 and 5 students please visit: https://www.keele.ac.uk/study/languagecentre/languagecentreoptions/

For Level 6 students please visit: https://www.keele.ac.uk/students/academiclife/global-challenge-pathways/

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For further information on the content of modules currently offered, please visit:
https://www.keele.ac.uk/recordsandexams/modulecatalogue/

A summary of the credit requirements per year is as follows.

| Year | Compulsory | Optional | |
|---|---|---|---|
| | | Min | Max |
| Level 4 | 120 | 15 | 15 |
| Level 5 | 105 | 15 | 15 |
| Level 6 | 60 | 60 | 60 |

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## Module Lists

### *Level 4*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| Introduction to Programming | CSC-10070 | 15 | Semester 1 |
| Limits, Series and Calculus | MAT-10079 | 15 | Semester 1 |
| Introductory Mathematics for Data Scientists | MAT-10081 | 15 | Semester 1 |
| Professional Practices in Data Science | CSC-10081 | 30 | Semester 1-2 |
| Linear algebra | MAT-10073 | 15 | Semester 2 |
| Differential Equations and Multivariable Calculus | MAT-10075 | 15 | Semester 2 |
| Statistics with Applications in R | MAT-10077 | 15 | Semester 2 |

## *Level 5*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| Database Systems | CSC-20002 | 15 | Semester 1 |
| Visualisation for Data Science | CSC-20069 | 15 | Semester 1 |
| Data Science Techniques | CSC-20095 | 15 | Semester 1 |
| Probability | MAT-20023 | 15 | Semester 1 |
| Computational and Artificial Intelligence I | CSC-20043 | 15 | Semester 2 |
| Applied Deep Learning | CSC-20071 | 15 | Semester 2 |
| Data Science Projects for Employability | MAT-20045 | 15 | Semester 2 |

| Optional modules | Module Code | Credits | Period |
|---|---|---|---|
| Flexible Work Placement (Level 5) | NAT-20011 | 15 | Semester 1-2 |
| Software Engineering | CSC-20041 | 15 | Semester 2 |
| Computer Graphics and Animation | CSC-20079 | 15 | Semester 2 |
| Abstract Algebra | MAT-20025 | 15 | Semester 2 |

### Level 5 Module Rules

At Level 5, students take 105 credits of compulsory modules. The remaining 15 credits may either be used to take a Global Challenge Pathway, a language module or an optional module.

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6)

## *Level 6*

| Compulsory modules | Module Code | Credits | Period |
|---|---|---|---|
| Machine Learning Applications | CSC-30041 | 15 | Semester 1 |
| Data Science Project | CSC-30065 | 30 | Semester 1-2 |
| Data Ethics and Security | CSC-30045 | 15 | Semester 2 |

| Optional modules | Module Code | Credits | Period |
|---|---|---|---|
| Cyber Security | CSC-30057 | 15 | Semester 1 |
| Number Theory and Cryptography | MAT-30038 | 15 | Semester 1 |
| Data Analysis and Modelling | PHY-30059 | 15 | Semester 1 |
| Flexible Work Placement (Level 6) | NAT-30008 | 15 | Semester 1-2 |
| Professional Experience in Education | NAT-30012 | 15 | Semester 1-2 |
| Advanced Databases and Applications | CSC-30002 | 15 | Semester 2 |
| Communications and Networks | CSC-30012 | 15 | Semester 2 |
| Computational and Artificial Intelligence II | CSC-30027 | 15 | Semester 2 |
| Medical Statistics | MAT-30014 | 15 | Semester 2 |

### Level 6 Module Rules

Please note: You cannot take both Flexible Work Placement (Level 5) and Flexible Work Placement (Level 6). You also cannot take both Flexible Work Placement (Level 6) and Professional Experience in Education.

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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 4*

| Subject Knowledge and Understanding | |
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| **Learning Outcome** | **Module in which this is delivered** |
| the context of data science area in relation to computer science, mathematics, statistics and software engineering | Professional Practices in Data Science; Introduction to Programming |
| the science of data investigation and data visualisation and the applications of statistics to data analysis | Professional Practices in Data Science; Statistics with Applications in R |
| the relevant mathematical concepts and techniques | Limits, Series and Calculus; Linear Algebra; Differential Equations and Multivariable Calculus |
| probability-based models, hypothesis testing, statistical inference and likelihood | Professional Practices in Data Science; Statistics with Applications in R |
| handling data within the context of data governance, data security, and communications | Professional Practices in Data Science |
| applications of data science to improve an organisation's processes, operations and outputs | Professional Practices in Data Science |
| the context of professional, economic, social, environmental, moral and ethical considerations involved in data analysis | Professional Practices in Data Science |
| systematic data handling, through an awareness of key platforms for data and analysis in an organisation, including data processing/storage and database systems | Professional Practices in Data Science |
| designing, implementing and optimising analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods, advanced and predictive analytics, machine learning and artificial intelligence techniques, simulations, optimisation, and automation | Introduction to Programming; Professional Practices in Data Science |
| the computational and organisational resource constraints and trade-offs involved in selecting models, algorithms and tools | Introduction to Programming; Professional Practices in Data Science |
| development standards, including programming practice, testing, source control | Introduction to Programming; Professional Practices in Data Science |
| the data landscape, involving critical analysis and interpretation of complex information from diverse dataset, as well as data formats, structures and data delivery methods including "unstructured" data, observing common patterns in real-world data | Introduction to Programming; Professional Practices in Data Science |

| Subject Specific Skills | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Identify appropriate problems an organisation faces and reformulate them into data science problems. Devise solutions and make decisions in context by seeking feedback from stakeholders. Apply scientific methods through experiment design, measurement, hypothesis testing and delivery of results. Collaborate with colleagues to gather requirements. | Professional Practices in Data Science; Statistics with Applications in R |

| Subject Specific Skills | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Perform data engineering: create and handle datasets for analysis. Use tools and techniques to source, access, explore, profile, pipeline, combine, transform and store data, and apply governance (quality control, security, privacy) to data. | Professional Practices in Data Science; Statistics with Applications in R |
| Identify and use an appropriate range of programming languages and mathematical tools for data manipulation, analysis, visualisation, and system integration. Select appropriate data structures and algorithms for the problem. Develop reproducible analysis and robust code, working in accordance with software development standards, including security, accessibility, code quality and version control. | All Level 4 modules |
| design, implement and optimise analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods. | All Level 4 modules |
| Use analysis and models to inform and improve organisational outcomes, building models and validating results with statistical testing: perform statistical analysis, correlation vs causation, feature selection and engineering, machine learning, optimisation, and simulations, using the appropriate techniques for the problem. | Professional Practices in Data Science; Statistics with Applications in R; |
| Implement data solutions, using relevant software engineering architectures and design patterns. Evaluate cloud vs. on premise deployment. Determine the implicit and explicit value of data. Assess value for money and return on investment. Scale a system up/out. Evaluate emerging trends and new approaches. Compare the pros and cons of software applications and techniques. | Professional Practices in Data Science; Introduction to Programming |
| Find, present, communicate and disseminate outputs effectively and with high impact through creative storytelling, tailoring the message for the audience. Use the best medium for each audience, such as technical writing, reporting and dashboards. Visualise data to tell compelling and actionable narratives. Make recommendations to decision makers to contribute towards the achievement of organisation goals. | Professional Practices in Data Science; Introduction to Programming; Statistics with Applications in R |
| Develop and maintain collaborative relationships at strategic and operational levels, using methods of organisational empathy (human, organisation and technical) and build relationships through active listening and trust development. | Professional Practices in Data Science |
| Use project delivery techniques and tools appropriate to their data science project and organisation. Plan, organise and manage resources to successfully run a small data science project, achieve organisational goals and enable effective change. | Professional Practices in Data Science |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| follow an inquisitive approach and have the curiosity to explore new questions, opportunities, data, and techniques along with tenacity to improve methods and maximise insights and relentless creativity in their approach to solutions. | All Level 4 modules |
| demonstrate empathy and positive engagement to enable working and collaborating in multi-disciplinary teams, championing and highlighting ethics and diversity in data work. | All Level 4 modules |
| show adaptability and dynamism when responding to varied tasks and organisational timescales, and pragmatism in the face of real-world scenarios. | All Level 4 modules |
| follow an impartial, scientific, hypothesis-driven approach to work, rigorous data analysis methods, and integrity in presenting data and conclusions in a truthful and appropriate manner. | All Level 4 modules |
| have commitment to keeping up to date with current thinking and maintaining personal development. Including collaborating with the data science community. | All Level 4 modules |
| construct well-argued and grammatically correct documents, locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed. | Professional Practices in Data Science; Introduction to Programming; Statistics with Applications in R |
| recognise factors in environmental and societal contexts relating to the opportunities and challenges created by data analytics and computing systems across a range of human activities. | Professional Practices in Data Science |
| apply academic theory learnt as part of the taught degree to real-world scenarios. | All Level 4 modules |
| reflect on their study activities and experiences and evaluate their learning in the context of the real world. | All Level 4 modules |
| explain how the professional data science and analytics sector operates and identify the skills required to pursue careers within the sector. | Professional Practices in Data Science |

## *Level 5*

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| the context of data science area in relation to computer science, mathematics, statistics and software engineering | Data Science Techniques; Computational and Artificial Intelligence I; Database Systems; Probability; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| the science of data investigation and data visualisation and the applications of statistics to data analysis | Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; Computer Graphics and Animation |
| the relevant mathematical concepts and techniques | Probability; Abstract Algebra |
| probability-based models, hypothesis testing, statistical inference and likelihood | Probability |
| handling data within the context of data governance, data security, and communications | Data Science Techniques; Data Science Projects for Employability |
| applications of data science to improve an organisation's processes, operations and outputs | Data Science Techniques; Data Science Projects for Employability; Applied Deep Learning; Visualisation for¿Data¿Science |
| the context of professional, economic, social, environmental, moral and ethical considerations involved in data analysis | Data Science Techniques; Data Science Projects for Employability; Applied Deep Learning; Visualisation for¿Data¿Science |
| systematic data handling, through an awareness of key platforms for data and analysis in an organisation, including data processing/storage and database systems | Data Science Techniques; Data Science Projects for Employability; Applied Deep Learning; Visualisation for¿Data¿Science |
| designing, implementing and optimising analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods, advanced and predictive analytics, machine learning and artificial intelligence techniques, simulations, optimisation, and automation | Data Science Techniques; Data Science Projects for Employability; Applied Deep Learning; Visualisation for¿Data¿Science; Computational and Artificial Intelligence I |
| the computational and organisational resource constraints and trade-offs involved in selecting models, algorithms and tools | Computational and Artificial Intelligence I; Data Science Techniques; Software Engineering; Computer Graphics and Animation |
| development standards, including programming practice, testing, source control | Data Science Techniques; Software Engineering |
| the data landscape, involving critical analysis and interpretation of complex information from diverse dataset, as well as data formats, structures and data delivery methods including "unstructured" data, observing common patterns in real-world data | Data Science Techniques; Data Science Projects for Employability; Applied Deep Learning; Visualisation for¿Data¿Science |

| Subject Specific Skills | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Identify appropriate problems an organisation faces and reformulate them into data science problems. Devise solutions and make decisions in context by seeking feedback from stakeholders. Apply scientific methods through experiment design, measurement, hypothesis testing and delivery of results. Collaborate with colleagues to gather requirements. | Data Science Techniques; Computational and Artificial Intelligence I; Database Systems; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; Software Engineering; Computer Graphics and Animation |

| Subject Specific Skills | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Perform data engineering: create and handle datasets for analysis. Use tools and techniques to source, access, explore, profile, pipeline, combine, transform and store data, and apply governance (quality control, security, privacy) to data. | Data Science Techniques; Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| Identify and use an appropriate range of programming languages and mathematical tools for data manipulation, analysis, visualisation, and system integration. Select appropriate data structures and algorithms for the problem. Develop reproducible analysis and robust code, working in accordance with software development standards, including security, accessibility, code quality and version control. | Data Science Techniques; Computational and Artificial Intelligence I; Probability; Database Systems; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; Software Engineering; Computer Graphics and Animation |
| design, implement and optimise analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods. | Probability; Abstract Algebra |
| Use analysis and models to inform and improve organisational outcomes, building models and validating results with statistical testing: perform statistical analysis, correlation vs causation, feature selection and engineering, machine learning, optimisation, and simulations, using the appropriate techniques for the problem. | Data Science Techniques; Probability; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| Implement data solutions, using relevant software engineering architectures and design patterns. Evaluate cloud vs. on premise deployment. Determine the implicit and explicit value of data. Assess value for money and return on investment. Scale a system up/out. Evaluate emerging trends and new approaches. Compare the pros and cons of software applications and techniques. | Data Science Techniques; Software Engineering; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; Database Systems; |
| Find, present, communicate and disseminate outputs effectively and with high impact through creative storytelling, tailoring the message for the audience. Use the best medium for each audience, such as technical writing, reporting and dashboards. Visualise data to tell compelling and actionable narratives. Make recommendations to decision makers to contribute towards the achievement of organisation goals. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| Develop and maintain collaborative relationships at strategic and operational levels, using methods of organisational empathy (human, organisation and technical) and build relationships through active listening and trust development. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; |
| Use project delivery techniques and tools appropriate to their data science project and organisation. Plan, organise and manage resources to successfully run a small data science project, achieve organisational goals and enable effective change. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability; |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| follow an inquisitive approach and have the curiosity to explore new questions, opportunities, data, and techniques along with tenacity to improve methods and maximise insights and relentless creativity in their approach to solutions. | All Level 5 modules |
| demonstrate empathy and positive engagement to enable working and collaborating in multi-disciplinary teams, championing and highlighting ethics and diversity in data work. | All Level 5 modules |
| show adaptability and dynamism when responding to varied tasks and organisational timescales, and pragmatism in the face of real-world scenarios. | All Level 5 modules |
| follow an impartial, scientific, hypothesis-driven approach to work, rigorous data analysis methods, and integrity in presenting data and conclusions in a truthful and appropriate manner. | All Level 5 modules |
| have commitment to keeping up to date with current thinking and maintaining personal development. Including collaborating with the data science community. | All Level 5 modules |
| construct well-argued and grammatically correct documents, locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| recognise factors in environmental and societal contexts relating to the opportunities and challenges created by data analytics and computing systems across a range of human activities. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |
| apply academic theory learnt as part of the taught degree to real-world scenarios. | All Level 5 modules |
| reflect on their study activities and experiences and evaluate their learning in the context of the real world. | All Level 5 modules |
| explain how the professional data science and analytics sector operates and identify the skills required to pursue careers within the sector. | Data Science Techniques; Applied Deep Learning; Visualisation for¿Data¿Science; Data Science Projects for Employability |

## *Level 6*

| Subject Knowledge and Understanding | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| the context of data science area in relation to computer science, mathematics, statistics and software engineering | Machine Learning Applications; Data¿Ethics and Security; Data Analysis and Model Testing; Computational and Artificial Intelligence II; Medical Statistics; Number Theory and Cryptography; Cyber Security¿ |
| the science of data investigation and data visualisation and the applications of statistics to data analysis | Machine Learning Applications; Data¿Ethics and Security; Data Analysis and Model Testing; |
| the relevant mathematical concepts and techniques | Medical Statistics; Number Theory and Cryptography |
| probability-based models, hypothesis testing, statistical inference and likelihood | Medical Statistics |
| handling data within the context of data governance, data security, and communications | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project |
| applications of data science to improve an organisation's processes, operations and outputs | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II |
| the context of professional, economic, social, environmental, moral and ethical considerations involved in data analysis | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II |
| systematic data handling, through an awareness of key platforms for data and analysis in an organisation, including data processing/storage and database systems | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II; Advanced¿Databases and Applications |
| designing, implementing and optimising analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods, advanced and predictive analytics, machine learning and artificial intelligence techniques, simulations, optimisation, and automation | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II; Medical Statistics |
| the computational and organisational resource constraints and trade-offs involved in selecting models, algorithms and tools | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II |
| development standards, including programming practice, testing, source control | Machine Learning Applications; Data¿Ethics and Security; Computational and Artificial Intelligence II |
| the data landscape, involving critical analysis and interpretation of complex information from diverse dataset, as well as data formats, structures and data delivery methods including "unstructured" data, observing common patterns in real-world data | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II |

| Subject Specific Skills | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| Identify appropriate problems an organisation faces and reformulate them into data science problems. Devise solutions and make decisions in context by seeking feedback from stakeholders. Apply scientific methods through experiment design, measurement, hypothesis testing and delivery of results. Collaborate with colleagues to gather requirements. | Machine Learning Applications; Data¿Ethics and Security; Cyber Security;¿ Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II; Medical Statistics; Number Theory and Cryptography |
| Perform data engineering: create and handle datasets for analysis. Use tools and techniques to source, access, explore, profile, pipeline, combine, transform and store data, and apply governance (quality control, security, privacy) to data. | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Computational and Artificial Intelligence II |
| Identify and use an appropriate range of programming languages and mathematical tools for data manipulation, analysis, visualisation, and system integration. Select appropriate data structures and algorithms for the problem. Develop reproducible analysis and robust code, working in accordance with software development standards, including security, accessibility, code quality and version control. | All Level 6 modules |
| design, implement and optimise analytical algorithms - as prototypes and at production scale - using statistical and mathematical models and methods. | Machine Learning Applications; Data¿Science¿Project; Computational and Artificial Intelligence II |
| Use analysis and models to inform and improve organisational outcomes, building models and validating results with statistical testing: perform statistical analysis, correlation vs causation, feature selection and engineering, machine learning, optimisation, and simulations, using the appropriate techniques for the problem. | Machine Learning Applications; Data¿Ethics and Security; Cyber Security;¿ Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II; Medical Statistics; Number Theory and Cryptography; |
| Implement data solutions, using relevant software engineering architectures and design patterns. Evaluate cloud vs. on premise deployment. Determine the implicit and explicit value of data. Assess value for money and return on investment. Scale a system up/out. Evaluate emerging trends and new approaches. Compare the pros and cons of software applications and techniques. | Machine Learning Applications; Data¿Ethics and Security; Data¿Science¿Project; Advanced¿Databases and Applications; Computational and Artificial Intelligence II |
| Find, present, communicate and disseminate outputs effectively and with high impact through creative storytelling, tailoring the message for the audience. Use the best medium for each audience, such as technical writing, reporting and dashboards. Visualise data to tell compelling and actionable narratives. Make recommendations to decision makers to contribute towards the achievement of organisation goals. | Machine Learning Applications; Data¿Ethics and Security;¿ Data¿Science¿Project; Computational and Artificial Intelligence II |
| Develop and maintain collaborative relationships at strategic and operational levels, using methods of organisational empathy (human, organisation and technical) and build relationships through active listening and trust development. | Machine Learning Applications; Data¿Science¿Project |
| Use project delivery techniques and tools appropriate to their data science project and organisation. Plan, organise and manage resources to successfully run a small data science project, achieve organisational goals and enable effective change. | Machine Learning Applications; Data¿Science¿Project |

| Key or Transferable Skills (graduate attributes) | |
|---|---|
| **Learning Outcome** | **Module in which this is delivered** |
| follow an inquisitive approach and have the curiosity to explore new questions, opportunities, data, and techniques along with tenacity to improve methods and maximise insights and relentless creativity in their approach to solutions. | All Level 6 modules |
| demonstrate empathy and positive engagement to enable working and collaborating in multi-disciplinary teams, championing and highlighting ethics and diversity in data work. | All Level 6 modules |
| show adaptability and dynamism when responding to varied tasks and organisational timescales, and pragmatism in the face of real-world scenarios. | All Level 6 modules |
| follow an impartial, scientific, hypothesis-driven approach to work, rigorous data analysis methods, and integrity in presenting data and conclusions in a truthful and appropriate manner. | All Level 6 modules |
| have commitment to keeping up to date with current thinking and maintaining personal development. Including collaborating with the data science community. | All Level 6 modules |
| construct well-argued and grammatically correct documents, locate and retrieve relevant ideas, and ensure these are correctly and accurately referenced and attributed. | Machine Learning Applications; Data¿Ethics and Security;¿ Data¿Science¿Project; Computational and Artificial Intelligence II |
| recognise factors in environmental and societal contexts relating to the opportunities and challenges created by data analytics and computing systems across a range of human activities. | Machine Learning Applications; Data¿Ethics and Security;¿ Data¿Science¿Project; Computational and Artificial Intelligence II |
| apply academic theory learnt as part of the taught degree to real-world scenarios. | All Level 6 modules |
| reflect on their study activities and experiences and evaluate their learning in the context of the real world. | All Level 6 modules |
| explain how the professional data science and analytics sector operates and identify the skills required to pursue careers within the sector. | Machine Learning Applications; Data¿Ethics and Security;¿ Data¿Science¿Project; Computational and Artificial Intelligence II |

## 9. Final and intermediate awards

Credits required for each level of academic award are as follows:

| | | |
|---|---|---|
| **BSc (Hons) Data Science** | 360 credits | You will require at least 120 credits at levels 4, 5 and 6<br><br>You must accumulate at least 270 credits in your main subject (out of 360 credits overall), with at least 90 credits in each of the three years of study, to graduate with a named single honours degree in this subject. |
| **Diploma in Higher Education** | 240 credits | You will require at least 120 credits at level 4 or higher and at least 120 credits at level 5 or higher |
| **Certificate in Higher Education** | 120 credits | You will require at least 120 credits at level 4 or higher |

**International Year option:** in addition to the above students must pass a module covering the international year in order to graduate with a named degree including the 'international year' wording. Students who do not complete, or fail the international year, will be transferred to the three-year version of the programme.

**Work Placement Year option:** in addition to the above students must pass a non-credit bearing module covering the work placement year in order to graduate with a named degree including the 'with Work Placement Year' wording. Students who do not complete, or fail the work placement year, will be transferred to the three-year version of the programme.

## 10. 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:

- **Unseen examinations:** test a student's knowledge and understanding of the subject, mostly applicable to mathematics aspects of the discipline. They are the usual, primary mode of assessment in mathematics programmes across the HE sector. Such examinations are typically of two hours in length. Some taught modules have unseen examinations as part of the assessment profile.
- **Class tests:** these are taken during the course of a module, usually in a lecture slot. They are intended to assess a student's current understanding and subject knowledge in that module in a structured and focused manner. Some taught modules have class tests as part of the assessment profile. In some modules the class tests are computer-based.
- **Coursework:** normally consists of regular short assignments designed to assess, in more depth than class tests, a student's knowledge and understanding of the course material. Some of these assignments may be computer-based, and some may take the form of short reports.
- **Short reports:** for which students are required to write up their own account of small group studies and discussions on particular topics.
- **Project Reports:** are formal summaries of the work done by a student undertaking a project. Projects would typically involve the analysis of real-world data and the report will test the student's ability to make critical judgements concerning the appropriateness of different strategies for the collection and analysis of such data.
- **Video presentations:** where students produce an informative video presentation suitable for a general audience which explains their project, its purpose and the outcomes. These videos are presented to the class and can be live, animated, or a combination of both.
- **Oral presentations:** assess a student's ability to communicate their knowledge and understanding, both visually and orally, to both general and academic audiences.

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.

## 11. Contact Time and Expected Workload

This contact time measure is intended to provide you with an indication of the type of activity you are likely to undertake during this programme. The data is compiled based on module choices and learning patterns of students on similar programmes in previous years. Every effort is made to ensure this data is a realistic

representation of what you are likely to experience, but changes to programmes, teaching methods and assessment methods mean this data is representative and not specific.

Undergraduate courses at Keele contain an element of module choice; therefore, individual students will experience a different mix of contact time and assessment types dependent upon their own individual choice of modules. The figures below are an example of activities that a student may expect on your chosen course by year stage of study. Contact time includes scheduled activities such as: lecture, seminar, tutorial, project supervision, demonstration, practical classes and labs, supervised time in labs/workshop, fieldwork and external visits. The figures are based on 1,200 hours of student effort each year for full-time students.

**Activity**

| | **Scheduled learning and teaching activities** | **Guided independent Study** | **Placements** |
|---|---|---|---|
| **Year 1 (Level 4)** | 26.9% | 73.1% | 0% |
| **Year 2 (Level 5)** | 26.1% | 72.1% | 1.8% |
| **Year 3 (Level 6)** | 15.7% | 84.3% | 0% |

## 12. Accreditation

This programme does not have accreditation from an external body.

## 13. 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'.

## 14. 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/

**English for Academic Purposes**

Please note: All new international students entering the university will provide a sample of Academic English during their registration Using this sample, the Language Centre may allocate you to an English language module which will become compulsory. This will replace any GCP modules. *NB:* students can take an EAP module only with the approval of the English Language Programme Director and are not able to take any other Language modules in the same academic year.

English Language Modules at Level 4:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2)
- Science - ENL-90013 Academic English for Science Students
- General - ENL-90006 English for Academic Purposes 2; ENL-90001 English for Academic Purposes 3; ENL-90002 English for Academic Purposes 4

English Language Modules at Level 5:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2)
- Science - ENL-90013 Academic English for Science Students
- General - ENL-90006 English for Academic Purposes 2; ENL-90001 English for Academic Purposes 3; ENL-90002 English for Academic Purposes 4

English Language Modules at Level 6:

- Business - ENL-90003 Academic English for Business Students (Part 1); ENL-90004 Academic English for Business Students (2); ENL-90005 Advanced Business English Communication
- Science - ENL-90013 Academic English for Science Students
- General - ENL-90006 English for Academic Purposes 2; ENL-90001 English for Academic Purposes 3; ENL-90002 English for Academic Purposes 4

**Recognition of Prior Learning (RPL)** is considered on a case-by-case basis and those interested should contact the Programme Director. The University's guidelines on this can be found here: http://www.keele.ac.uk/qa/accreditationofpriorlearning/

## 15. How are students supported on the programme?

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

- Module lecturers and Examples Class tutors are responsible for providing support for learning on the modules. They also give individual feedback on coursework assignments and more general feedback on examinations. The Mathematics Division has an Open Door policy so that lecturers and tutors are happy to see and advise students at any reasonable time, or by a mutually convenient appointment.
- Every student is allocated to an Academic Mentor who is responsible for reviewing and advising on students' academic progress in Mathematics and on their other Principal Programme.
- Academic Mentors also act as a first point of contact for students on non-academic issues which may affect their learning and can refer students on to a range of specialist health, welfare and financial services co-ordinated by the University's Student Services.

## 16. Learning Resources

Data Science is taught, primarily, in lecture theatres, teaching rooms and computer laboratories. As part of the School of Computing and Mathematics, students have access to the large computer science laboratory. There is also a room reserved exclusively for private study.

The learning resources available to students 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. Students have individual email accounts and file stores on University and School servers. Additional facilities are provided for final year projects.
- 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 students from anywhere in the world with a University username and password.

## 17. Other Learning Opportunities

### Study abroad (semester)

Students on the programme have the potential opportunity to spend a semester abroad in their second year studying at one of Keele's international partner universities.

Exactly which countries are available depends on the student's choice of degree subjects. An indicative list of countries is on the website (http://www.keele.ac.uk/studyabroad/partneruniversities/); however, this does not guarantee the availability of study in a specific country as this is subject to the University's application process for studying abroad.

No additional tuition fees are payable for a single semester studying abroad but students do have to bear the costs of travelling to and from their destination university, accommodation, food and personal costs. Depending on the destination they are studying at additional costs may include visas, study permits, residence permits, and compulsory health checks. Students should expect the total costs of studying abroad to be greater than if they study in the UK, information is made available from the Global Education Team throughout the process, as costs will vary depending on destination.

Whilst students are studying abroad any Student Finance eligibility will continue, where applicable students may be eligible for specific travel or disability grants. Students studying in Erasmus+ destinations may be eligible for grants as part of this programme. Students studying outside of this programme may be eligible for income dependent bursaries at Keele. Students travel on a comprehensive Keele University insurance plan, for which there are currently no additional charges. Some governments and/or universities require additional compulsory health coverage plans; costs for this will be advised during the application process.

### Study Abroad (International Year)

A summary of the International Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the International Year.

### Work Placement Year

Students have the opportunity to apply directly for the 4-year 'with Work Placement Year' degree programme or to transfer onto the 4-year degree programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking their year-long placement. To be eligible for the placement year, students must have a good University attendance record. They must also have passed all Year 1 and Year 2 Semester 1 modules. Students must have met the progression requirements to proceed to their final year of study prior to commencing a placement.

Students wishing to take the work placement year should meet with the Programme Director to obtain their signature to confirm agreement before they will be allowed to commence their placement.

International students who require a Tier 4 visa must check with the Immigration Compliance Team prior to commencing any form of placement.

A summary of the Work Placement Year, which is a potential option for students after completion of year 2 (Level 5), is provided in the Annex for the Work Placement Year.

## 18. 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.

## 19. 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 Revalidation 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 National Student Survey (NSS), 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 in all three years of 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/

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

# 21. Annex - International Year

### Data Science with International Year

**International Year Programme**

Students registered for this Single Honours programme may either be admitted for or apply to transfer during their period of study at Level 5 to the International Year option. Students accepted onto this option will have an extra year of study (the International Year) at an international partner institution after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the International Year will be permitted to progress to Level 6. Students who fail to satisfy the examiners in respect of the International Year will normally revert to the standard programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the International Year option.

**International Year Programme Aims**

In addition to the programme aims specified in the main body of this document, the international year programme of study aims to provide students with:

1. Personal development as a student and a researcher with an appreciation of the international dimension of their subject
2. Experience of a different culture, academically, professionally and socially

**Entry Requirements for the International Year**

Students may apply to the 4-year programme during Level 5. Admission to the International Year is subject to successful application, interview and references from appropriate staff.

The criteria to be applied are:

- Academic Performance - an average of 55% across all modules in Semester 1 at Level 5 is normally required. Places on the International Year are then conditional on achieving an average mark of 55% across all Level 5 modules. Students with up to 15 credits of re-assessment who meet the 55% requirement may progress to the International Year. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account.
- General Aptitude (to be demonstrated by application for study abroad, interview during the 2nd semester of year 2 (Level 5), and by recommendation of the student's Academic Mentor, 1st and 2nd year tutors and programme director)

Students may not register for both an International Year and a Placement Year.

**Student Support**

Students will be supported whilst on the International Year via the following methods:

- Phone or Skype conversations with Study Abroad tutor, in line with recommended Academic Mentoring meeting points.
- Support from the University's Global Education Team

**Learning Outcomes**

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete a Keele undergraduate programme with International Year will be able to:

1. Describe, discuss and reflect upon the cultural and international differences and similarities of different learning environments
2. Discuss the benefits and challenges of global citizenship and internationalisation
3. Explain how their perspective on their academic discipline has been influenced by locating it within an international setting.

These learning outcomes will all be assessed by the submission of a satisfactory individual learning agreement, the successful completion of assessments at the partner institution and the submission of the reflective portfolio element of the international year module.

**Regulations**

Students registered for the International Year are subject to the programme-specific regulations (if any) and the University regulations. In addition, during the International Year, the following regulations will apply:

Students undertaking the International Year must complete 120 credits, which must comprise *at least 40%* in the student's discipline area.

This may impact on your choice of modules to study, for example you will have to choose certain modules to ensure you have the discipline specific credits required.

Students are barred from studying any module with significant overlap to the Level 6 modules they will study on their return. Significant overlap with Level 5 modules previously studied should also be avoided.

**Additional costs for the International Year**

Tuition fees for students on the International Year will be charged at 15% of the annual tuition fees for that year of study, as set out in Section 1. The International Year can be included in your Student Finance allocation, to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their destination university, accommodation, food and personal costs. Depending on the destination they are studying at additional costs may include visas, study permits, residence permits, and compulsory health checks. Students should expect the total costs of studying abroad be greater than if they study in the UK, information is made available from the Global Education Team throughout the process, as costs will vary depending on destination.

Students who meet external eligibility criteria may be eligible for grants as part of this programme. Students studying outside of this programme may be eligible income dependent bursaries at Keele.

Students travel on a comprehensive Keele University insurance plan, for which there are currently no additional charges. Some Governments and/or universities require additional compulsory health coverage plans; costs for this will be advised during the application process.

## 22. Annex - Work Placement Year

### Data Science with Work Placement Year

**Work Placement Year summary**

Students registered for this programme may either be admitted for or apply to transfer during their studies to the 'with Work Placement Year' option (NB: for Combined Honours students the rules relating to the work placement year in the subject where the placement is organised are to be followed). Students accepted onto this programme will have an extra year of study (the Work Placement Year) with a relevant placement provider after they have completed Year 2 (Level 5) at Keele.

Students who successfully complete both the second year (Level 5) and the Work Placement Year will be permitted to progress to Level 6. Students who fail to satisfactorily complete the Work Placement Year will normally revert to the 3-year programme and progress to Level 6 on that basis. The failure will be recorded on the student's final transcript.

Study at Level 4, Level 5 and Level 6 will be as per the main body of this document. The additional detail contained in this annex will pertain solely to students registered for the Work Placement Year option.

**Work Placement Year Programme Aims**

In addition to the programme aims specified in the main body of this document, the Work Placement Year aims to provide students with:

- An opportunity to carry out a long-term work-based learning experience (minimum 30 weeks equivalent of full-time work) in the sector between Years 2 and 3 (Levels 5 and 6) of their degree programme. The module will be underpinned by employability skills training (as part of their preparation during year 2), reflective assessment, employer and tutor evaluation and support from academic tutors.

**Entry Requirements for the Work Placement Year**

Admission to the Work Placement Year is subject to successful application, interview and references from appropriate staff. Students have the opportunity to apply directly for the 4-year 'with work placement year' degree programme, or to transfer onto the 4-year programme at the end of Year-1 and in Year-2 at the end of Semester 1. Students who are initially registered for the 4-year degree programme may transfer onto the 3-year degree programme at any point in time, prior to undertaking the year-long work placement. Students who fail to pass the work placement year, and those who fail to meet the minimum requirements of the work placement year module, (* or equivalent, work placement), will be automatically transferred onto the 3-year degree programme.

* We recommend where possible students undertake a placement of between 9 - 12 months on a full-time basis to maximize academic and personal growth. However, the Faculty of Natural Sciences Work / Professional Placement Year mandates a minimum of 24 weeks in duration, ideally on a full-time basis, but no less than 21 hours per week. This enables those undertaking an unpaid placement to work on a part-time basis alongside their placement.

The criteria to be applied are:

- A good University attendance record and be in 'good academic standing'.
- Academic Performance (an average of 50% across all modules in Semester 1 at Level 5 is normally required. Places on the Work Placement Year are then conditional on achieving an average mark of 50% across all Level 5 modules. Students with up to 15 credits of re-assessment who meet the 50% requirement may progress to the Work Placement Year. Where no Semester 1 marks have been awarded performance in 1st year marks and ongoing 2nd year assessments are taken into account)
- Students undertaking work placements will be expected to complete a Health and Safety checklist prior to commencing their work experience and will be required to satisfy the Health and Safety regulations of the company or organisation at which they are based.
- *(International students only)* Due to visa requirements, it is not possible for international students who require a Tier 4 Visa to apply for direct entry onto the 4-year with Work Placement Year degree programme. Students wishing to transfer onto this programme should discuss this with student support, the academic tutor for the work placement year, and the Programme Lead. Students should be aware that there are visa implications for this transfer, and it is the student's responsibility to complete any and all necessary processes to be eligible for this programme. There may be additional costs, including applying for a new Visa from outside of the UK for international students associated with a transfer to the work placement programme.

Students may not register for both an International Year and a Work Placement Year.

**Student Support**

Students will be supported whilst on the Work Placement Year via the following methods:

- Regular contact between the student and a named member of staff who will be assigned to the student as their University supervisor. The University supervisor will be in regular contact with the student throughout the year, and be on hand to provide advice (pastoral or academic) and liaise with the Placement supervisor on the student's behalf if required.
- Two formal contacts with the student during the placement year: the University supervisor will visit the student in their placement organization at around 5 weeks after the placement has commenced, and then visit again (or conduct a telephone/video call tutorial) at around 15 weeks into the placement.
- Weekly supervision sessions will take place with the placement supervisor (or his/her nominee) throughout the duration of the placement.

**Learning Outcomes**

In addition to the learning outcomes specified in the main text of the Programme Specification, students who complete the 'with Work Placement Year' option will be able to:

- Evaluate their own employability skills (via a SWOT Analysis).
- Create ILOs for their placement in order to develop the skills areas which they have identified as being weak or needing further enhancement.
- Develop, through practice in the work place, the work-related skills identified through their SWOT analysis and ILOs.
- Apply academic theory learnt as part of the taught degree to real situations in the work place.
- Reflect on their work placement activities and experiences and evaluate the impact on their employability skills.
- Explain how the professional computing sector operates and identify the skills required to pursue careers within the sector.

These learning outcomes will be assessed through the non-credit bearing Work Placement Year module (NAT-30010) which involves:

- a Mid-Placement Portfolio;
- a Final Placement Portfolio;
- an Oral Presentation.

**Regulations**

Students registered for the 'with Work Placement Year' option are subject to programme-specific regulations (if any) and the University regulations. In addition, during the Work Placement Year, the following regulations will apply:

- Students undertaking the Work Placement Year must successfully complete the zero-credit rated 'Work Placement Year' module (NAT-30010)
- In order to ensure a high quality placement experience, each placement agency will sign up to a placement contract (analogous to a service level agreement).
- Once a student has been accepted by a placement organisation, the student will make a pre-placement visit and a member of staff identified within the placement contract will be assigned as the placement supervisor. The placement supervisor will be responsible for ensuring that the placement experience meets the agreed contract agreed with the University.
- The placement student will also sign up an agreement outlining his/her responsibilities in relation to the requirements of each organisation.

Students will be expected to behave professionally in terms of:

(i) conforming to the work practices of the organisation;  and

(ii) remembering that they are representatives of the University and their actions will reflect on the School and have an impact on that organisation's willingness (or otherwise) to remain engaged with the placement.

**Additional costs for the Work Placement Year**

Tuition fees for students on the Work Placement Year will be charged at 20% of the annual tuition fees for that year of study, as set out in Section 1. The Work Placement Year can be included in your Student Finance allocation; to find out more about your personal eligibility see: www.gov.uk

Students will have to bear the costs of travelling to and from their placement provider, accommodation, food and personal costs. Depending on the placement provider additional costs may include parking permits, travel and transport, suitable clothing, DBS checks, and compulsory health checks.

A small stipend may be available to students from the placement provider during the placement but this will need to be explored on a placement-by-placement basis as some organisations, such as charities, may not have any extra money available. Students should budget with the assumption that their placement will be unpaid.

Eligibility for student finance will depend on the type of placement and whether it is paid or not. If it is paid, this is likely to affect student finance eligibility, however if it is voluntary and therefore unpaid, should not affect student finance eligibility. Students are required to confirm eligibility with their student finance provider.

International students who require a Tier 4 visa should check with the Immigration Compliance team prior to commencing any type of paid placement to ensure that they are not contravening their visa requirements.

# Version History

## This document

**Date Approved:** 14 April 2026

### *What's Changed*

Version for Level 5 cohort in 2026/27

## Previous documents

| Version No | Year | Owner | Date Approved | Summary of and rationale for changes |
|---|---|---|---|---|
| 1 | 2025/26 | DANILA PRIKAZCHIKOV | 11 March 2025 | |
| 1.2 | 2024/25 | PETER WOOTTON | 14 April 2026 | Version for Level 6 cohort in 2026/27 |
| 1.1 | 2024/25 | PETER WOOTTON | 03 December 2025 | Faculty placement modules added |
| 1 | 2024/25 | DANILA PRIKAZCHIKOV | 04 June 2024 | |
| 1.2 | 2023/24 | DANILA PRIKAZCHIKOV | 11 March 2025 | Version for Level 6 students in 2025/26 - no changes |
| 1.1 | 2023/24 | DANILA PRIKAZCHIKOV | 26 July 2024 | General updates for 2024/25 |
| 1 | 2023/24 | DANILA PRIKAZCHIKOV | 19 January 2023 | |
| 1 | 2022/23 | PAUL TRUMAN | 13 May 2022 | |
| 1 | 2021/22 | THEO KYRIACOU | 11 February 2021 | |