

**Programme Specification**

**Title of Course: MSc Data Science**

**Date Specification Produced: October 2019**

**Date Specification Last Revised: September 2022**

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content of each module can be found in the Course Guide, on the VLE (Canvas) and in individual Module Descriptors.

**SECTION 1: GENERAL INFORMATION**

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| **Title:** | MSc Data Science |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | Kingston University |
| **Location:** | Penrhyn Road |
| **Programme Accredited by:** | BCS The Chartered Institute for IT |

**SECTION 2: THE PROGRAMME**

1. **Programme Introduction**

This course builds on the established strengths of the Mathematics and Computer Science programmes and develops a multidisciplinary approach to the computational analysis of data. Contemporary society faces new challenges in the analysis of data, predictive analytics in support of decision making processes that are both mathematical and computational. There is an increasing demand for data-savvy professionals both in industry and in research who are able make sense of large amounts of data and apply it to the solution of relevant problems. The multidisciplinary nature of Data science is reflected in this MSc programme through the careful combination of modules in data management, analysis, modelling, visualisation and artificial intelligence (AI), which are taught by a cross-disciplinary team whose expertise encompasses mathematics, statistics, AI and machine learning, information management, and user experience design.

Data Science is one of the most rapidly expanding areas of employment globally, due to rapid and ongoing developments in computer systems and data gathering. Large data sets are widespread in business, science and government. In some areas they manifest as Big Data but irrespective of this, the manipulation of large datasets has applications in the sciences, finance, retail, and particularly the digital economy, “internet of things” and social media.

This course is an applications-focussed programme that targets a wide range of roles, such as Data Scientist, which is the emerging overarching term that encompasses a variety of roles including Data Analyst (investigation and exploration of data) and Data Engineer (storage, security and curation of data), across a broad spectrum of employers, in areas such as the creative arts, social enterprises, financial analysis, biomedical science, telecommunication and management consultancy. It constitutes a coherent, academically sound programme of study covering the modern methods required to solve problems in the evolving field of data science, together with the development of broader computing and analytical skills. Fundamentally the course curriculum develops computational, mathematical and statistical skills that are related to the analysis, manipulation and modelling of data, which are the key technical skills of a data scientist.

A successful student will, by the very nature of the course, have acquired specialist knowledge useful for the investigation and solution of quantitative problems in commerce and industry and have developed highly valued logical and analytical thought processes. Data Scientists tend to work within, or head-up, multidisciplinary teams and so throughout the course opportunities for the development of a range of key skills are embedded (in areas such as communication, teamwork, time and task management, and research). This broad range of skills is essential for employment.

The course is delivered by highly experienced and qualified expert staff, all of the permanent staff holding doctorates in their fields of expertise, augmented by guest speakers from industrial and research partners. Our research strengths most relevant to Data Science are in the fields of digital imaging, computer vision, wireless and mobile communications technologies and information systems. Research expertise and knowledge feeds directly into the taught courses and the School of Computer Science and Mathematics (CSM) has a long-standing reputation for providing a supportive learning environment for students.

The School’s overarching teaching ethos is discussed further in section F below but it is based on the principle that students should be engaged in active learning wherever possible. A largely problem-centred learning approach is adopted, whereby students begin with the problems of interest and learn the necessary theory and techniques required to solve them whilst solving them. (For example, this follows recognised good practice in statistics education from the American Statistical Association[[1]](#footnote-2)). Within this environment, traditional large-format lectures are rare and the majority of class sessions are in workshop or large and small group tutorial-style classes. Many of the problems considered, particularly those which are assessed, come from real-world and/or research-based applications. In order to facilitate the investigation of such problems, as well as mirror the situation in employment, extensive use is made of computational support. Students gain broad computing skills as well as experience of a variety of up to date professional, industry-standard software deployed on the University’s modern computing facilities, which also makes applications available to students off-site. The use of coursework emphasises more authentic assessments, which could be, for example, from business or research contacts in local SMEs or colleagues working with “big data” in the NHS, with appropriate ethical and IP approval, as necessary. For example, students will typically create applications, documentation and visualisations, writing reports and giving presentations. Students will have the opportunity in some assignments to identify topics and target audiences in consultation with teaching staff which allows them to express their individuality and appreciate the diversity within the course. In this way, as they progress through the course, students are guided and supported to assemble a portfolio of tangible outputs which explicitly evidences the knowledge and skills gained and may be used to demonstrate their capabilities to future employers in a format that can be influenced by the students’ own preferences.

We continuously update our module content and themes to reflect the latest advances in the industry – for example while providing the essential knowledge about computer programming, databases and project management techniques, we also expose our students to the latest data visualisation approaches and data mining techniques. To support this we invest heavily in providing the latest equipment in the specialist computing laboratories of the School. These provide facilities such as multimedia equipment, games consoles, cameras and robotic units, and work in labs equipped with the latest networking hardware, high-spec PCs, Apple Macs and gaming consoles.

The Data Science degree course is interdisciplinary in nature and therefore allows students to work towards the requirements for professional recognition in the computing, mathematics and statistics professions, allowing students to play to their strengths as their career preferences solidify. Students will be encouraged to join the British Computer Society (BCS), Institute of Mathematics and its Applications (IMA) and/or the Royal Statistical Society (RSS) as student members. After graduation, a period of relevant employment can lead to membership of one or more professional bodies and may lead to Chartered status.

**Optional**: Data Science is offered with a Professional Placement. This option is to spend an additional year in industry as part of the course. The placement year is a 10 to 12 months period with 30-40 working hours per week. The placement role must be approved by the Faculty as being relevant to the degree.

Finding the placement is the responsibility of the individual students. If students do not find a suitable placement they will be switched onto the non-placement course.

1. **Aims of the Field/Course**

The overarching aim of the MSc Data Science programme is to provide practically based education and training for students seeking employment in the position of Data Scientist, Data Analyst, Data Engineerand similar roles. The course offers postgraduate students with some background in computing, mathematics, or data-based investigation the opportunity to develop their skills in a way which will prepare them for careers in this fast-growing and exciting area which spans virtually all areas of commerce and industry as well as scientific research, and involves working with individuals and organisations to extract value from the ever-increasing volume of data that is available.

The principal aims of the MSc Data Science are:

* to equip students with the required knowledge, skills and attitudes to practice as professional data scientists now and in the future;
* prepare students for employment, research, further study and lifelong learning by developing their intellectual, problem-solving, practical and key (transferable) skills;
* to equip students with the knowledge and skills to critically evaluate, select and employ the most appropriate techniques for the analysis of data and presentation of information to assist in decision-making;
* to develop within students an appreciation of the legal, ethical, social, cultural and public implications associated with the management, analysis and presentation of data;
* to produce graduates who are able to conceptualise, critically evaluate and communicate information effectively and persuasively in oral, visual and written forms for a variety of audiences.

The course is ideal for students who are interested in developing and applying problem-solving skills to real world problems, would like to develop their understanding of computational, mathematical and statistical techniques, and methods to interpret and represent data. With a balance of theory and practical application, this course builds on knowledge in relevant areas of statistics, data analysis, and programming.

1. **Intended Learning Outcomes**

The programme outcomes are referenced to the QAA subject benchmarks for [computing and mathematics](https://www.qaa.ac.uk/quality-code/subject-benchmark-statements) and the [Framework for Higher Education Qualifications of UK Degree-Awarding Bodies (2014)](https://www.qaa.ac.uk/en/quality-code/qualifications-and-credit-frameworks), and relate to the typical student. The course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills and graduate attributes in the following areas:

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| **Programme Learning Outcomes** |
|  | **Knowledge and Understanding**On completion of the course students will be able to: |  | **Intellectual Skills**On completion of the course students will be able to |  | **Subject Practical Skills**On completion of the course students will be able to |
| A1 | Specify and evaluate appropriate computational and statistical techniques applied to data science problems. | B1 | Conceptualise, analyse, abstract and decompose problems to design and subsequently test and maintain effective models and solutions in data science. | C1 | Use appropriate software to perform large-scale data analysis, visualisation, interpretation and prediction. |
| A2 | Evaluate key ethical, legal, social and professional issues in applied data science. | B2 | Synthesise information from disparate and potentially incomplete sources to create models, documents and other related artefacts for a professional audience. | C2 | Collaborate and communicate effectively with other professionals/stakeholders to design, manage and deliver data science projects. |
| A3 | Demonstrate a critical awareness of current developments and future trends in data science. | B3 | Critically evaluate appropriate statistical methods and relevant computer applications, to assist in the solution of problems. | C3 | Implement data science solutions using a variety of contemporary software environments. |
| A4 | Analyse and critically evaluate different approaches to data and information representation, storage, transmission and presentation | B4 | Build upon the practical application of skills to make a significant contribution as a data professional within an organisation. | C4 | Keep up-to-date in the data science profession through relevant literature, research and using professional networks. |
| A5 | Demonstrate an understanding of underpinning theory appropriate to the work of a data scientist. | B5 | Deal confidently with complexity, lacunae and contradictions in a complex knowledge base using appropriate methods. | C5 | Relate academic theory to practice, develop and practise key personal and employability skills and show examples of the application of these skills.  |
| A6 | Apply knowledge in a professional context, including understanding of their professional development and the structure of the placement organisation (With Professional Placement Only). | B6 | Reflect critically on their experience during the professional placement, including research and information literacy, numeracy, management and leadership skills. (with Professional Placement Only). |  |  |

In addition to the programme learning outcomes identified overleaf, the programme of study defined in this programme specification will allow students to develop a range of Key Skills as follows:

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| **Key Skills** |
| **Self-Awareness Skills** | **Communication Skills** | **Interpersonal Skills** | **Research and information Literacy Skills** | **Numeracy Skills** | **Management & Leadership Skills** | **Creativity and Problem Solving Skills** |
| Take responsibility for own learning and plan for and record own personal development. | Express ideas clearly and unambiguously in writing and the spoken work. | Work well with others in a group or team. | Search for and select relevant sources of information. | Collect data from primary and secondary sources and use appropriate methods to manipulate and analyse this data. | Determine the scope of a task (or project). | Apply scientific and other knowledge to analyse and evaluate information and data and to find solutions to problems. |
| Recognise own academic strengths and weaknesses, reflect on performance and progress and respond to feedback. | Present, challenge and defend ideas and results effectively orally and in writing. | Work flexibly and respond to change. | Critically evaluate information and use it appropriately. | Present and record data in appropriate formats. | Identify resources needed to undertake the task (or project) and to schedule and manage the resources. | Work with complex ideas and justify judgements made through effective use of evidence. |
| Organise self effectively, agreeing and setting realistic targets, accessing support where appropriate and managing time to achieve targets. | Actively listen and respond appropriately to ideas of others. | Discuss and debate with others and make concession to reach agreement. | Apply the ethical and legal requirements in both the access and use of information. | Interpret and evaluate data to inform and justify arguments. | Evidence ability to successfully complete and evaluate a task (or project), revising the plan where necessary. | Work independently with patience and persistence, pursuing the solution of a problem to its conclusion. |
| Work effectively with limited supervision in unfamiliar contexts. |  | Give, accept and respond to constructive feedback. | Accurately cite and reference information sources. | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data. | Motivate and direct others to enable an effective contribution from all participants. |  |
|  |  | Show sensitivity and respect for diverse values and beliefs. | Use software and IT technology as appropriate. |  |  |  |

1. **Entry Requirements**

The minimum entry qualifications for the programme are:

A good honours degree in a subject with significant computing science or mathematics/statistics content. Typical appropriate first degree subjects would include: computer science (including software engineering or cyber security), mathematics, statistics, and engineering.

Exceptionally applicants with qualifications that do not meet the requirements, but with considerable relevant professional experience will be considered.

Overseas students are required to satisfy the Admissions Tutor that they have reached an equivalent academic standard as those required for home students.

A minimum IELTS score of 6.5 with 6.0 in Writing and no sections less than 5.5, or equivalent is required for those for whom English is not their first language.

Disclosure and Barring Services (DBS) clearance will not be required (unless, exceptionally required for the placement).

1. **Course Structure**

This course operates within the framework of the University’s Postgraduate Regulations. Courses in this framework are made up of modules that are designated at level 7. Single taught modules in the courses are valued at 30 credits and the course contains a project that has 60 credits. The minimum requirement for a Postgraduate Certificate is 60 level 7 credits, for a Postgraduate Diploma 120 level 7 credits and a Master's Degree 180 level 7 credits.

The optional Professional Placement module (additional year) will give 120 credits.

The awards available are detailed in section A and the Technical Annex, below. All students will be provided with the postgraduate regulations in the student handbook on Canvas (the University’s Virtual Learning Environment).

The course is offered as 1 year full-time, and normally 2 years part-time. The course design fully considers all student groups. Delivery of taught modules is in week-long blocks, normally two 1-week blocks separated by at least one week

Full-time students will complete the programme of study and assessment in 52 weeks. The normal study pattern for part-time students is that they should complete 4 modules over a two year period and complete their project within the same period.

Ethical, legal and professional issues relevant to Data Science are addressed within the context of the research methods part of the induction programme, the Individual Project and throughout the course. For example, ethics in the appropriate presentation of data and interpretation of statistics are discussed in the *Data Analytics and Visualisation* module, and legislation, security and related practices are part of *Databases and Data Management.*

To prevent assessment bunching and over-assessment, there is a planning meeting at the beginning of each teaching block.

**E1. Professional and Statutory Regulatory Bodies**

Not applicable.

**E2. Work-based learning, including sandwich courses**

Work placements are actively encouraged through the postgraduate Professional Placement scheme – although it is the responsibility of individual students to source and secure such placements. This allows students to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice.

The industrial placements team, aided by the Employability Co-ordinator, helps to prepare the students for interview and work, for example, with mock interview sessions, CV workshops, and industry speakers on employers’ needs.

Industry-hosted major projects are also welcomed, but again it is the responsibility of individual students to source and secure such arrangements, thereby giving them more experience and employability skills after their Master’s degree.

**E3. Outline Programme Structure**

The programme is made up of four taught modules each worth 30 credit points plus an individual project worth 60 credits. All students will be provided with the University Postgraduate Regulations. Full details of each module is provided in module descriptors and via the VLE.

The optional Professional Placement is undertaken following completion of the other modules – all deadlines for it are posted on the VLE. Students on placement complete a portfolio assessment which includes a reflection on how the theories they have learnt during their teaching year have helped them in their placement and demonstrates ability to apply their teaching in a real-world situation.

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| **Level 7** |
| **Core modules** | **Module code** | **Credit Value** | **Level**  | **Prerequisites** |
| Databases and Data Management | CI7320 | 30 | 7 | None |
| Data Analytics and Visualisation | CI7330 | 30 | 7 | None |
| Machine Learning and Artificial Intelligence | CI7520 | 30 | 7 | None |
| Applied Data Programming | CI7340 | 30 | 7 | None |
| Individual Project | CI7000 | 60 | 7 | None |
| **Students on the MSc Data Science with Professional Placement course additionally take:** Professional Placement  | CI7900 | 120 | 7 | None |

Students exiting the programme with 60 credits are eligible for the award of PgCert in Data Science.

Students exiting the programme with 120 credits are eligible for the award of PgDip in Data Science.

1. **Principles of Teaching, Learning and Assessment**

Students on postgraduate courses in the School of CSM come from diverse social, cultural and educational backgrounds and their past learning experiences are varied. The School’s broad strategy of aiming for problem-centred teaching and accessible, relevant (authentic) artefact-based assessment (assessment of learning by doing/creating) was created in recognition of this. The course adopts the University’s Inclusive Curriculum Design Principles to cater for this diversity and define the approaches to learning, teaching and assessment (LTA), pastoral care and employability with the following broad principles:

1. An inclusive curriculum with the student at the heart of the learning process encouraging choice in their focussed topics for investigation within the prescribed module assignment formats (where practical) and sharing experiences and perspectives within the course through discussion and presentation of results.
	* Module descriptors adopt problem-centred approaches which in turn facilitate an inclusive learning environment.
	* Curricula and approaches to LTA allow for expression of cohorts’ experiences and perspectives, ultimately for sharing and shaping understanding together. Modules and the dissertation challenge students’ epistemological and ontological approaches to the study of Data Science, including software and its legal, social and ethical aspects, data presentation and the impact on society and the interpretation of statistics, to develop approaches to critical evaluation of current and future knowledge.
	* Teaching sessions are problem-centred, predominantly workshop-based, and necessarily interactive to make best use of the intensive weeks of study interspersed with directed study. Workshops and the use of the VLE (or other cohort-inspired networking tools) allow students to investigate and share their understanding of new concepts, techniques and technologies. This approach is also designed to enhance their practical competency and confidence when dealing with a range of “users” (recognising the diversity of Data Science teams and roles).
	* The delivery is research informed, taking advantage of CSM’s diverse research portfolio, dynamically updated in accordance with advances in the field.
	* Modules incorporate opportunities to explore current developments in the field, in practice and applied settings incorporating student perspectives, real world situations, problem solving and task based learning. Content includes the opportunity for students to personalise the topics being explored and allow them to adapt summative assessments towards their personal interests and motivations, where practical, such as through the use of Data Science scenarios or appropriately-licensed datasets of personal interest in module assignments as well as the dissertation.
	* Teaching teams draw on the academic strengths and research interests of staff and use invited speakers and experts from research and industry to bolster the curriculum. This offers students up-to-date learning experiences from experts in these areas.
	* Students complete their MSc by conducting an individualised capstone research project, designed in collaboration with the Data Science team.
2. Assessment *for* learning (rather than solely *of* learning) enabling an inclusive student perspective in their design and application, permitting a degree of individual choice and direction for assessed tasks work.
	* All assessments have been designed at level 7, as appropriate for the Data Science MSc, to be inclusive, accessible, artefact-based and authentic to the field.
	* Students’ induction at the start of the course includes an introduction to the language of UK HEI assessment and the tools used to measure the quality of their academic performance.
	* The assessment strategy aims to incorporate an element of choice within a carefully designed framework of assessments that align with the diversity of a Data Scientist’s needs, and thus encourages students to be personally involved in their assessments. For example, students will have opportunities to choose to work with datasets reflecting their specialism or areas of interest in coursework assignments, provided the data is publicly available and appropriately licensed.
	* Students have formative tasks and feedback available within the workshops preceding all assessments. Teaching sessions adopt a range of activities (including practical tasks, case studies, group discussion, role play) to enrich the learning experience in a problem-centred, predominantly workshop-based setting, which directly supports the formulation of summative assessments.
	* Feedback on both formative tasks and summative work enables students to learn from assessment experiences, reflect alongside directed study and feed-forward that learning to future assessments, most critically to the final dissertation project.
3. An approach to the personal tutor system appropriate to the Data Science MSc, which provides opportunities for students to personalise their experience and track their academic and personal skills development.
	* The Course Leader is the nexus of the postgraduate personal tutor system and normally acts as the formal Personal Tutor, supported day-to-day during intensive week-block teaching by the course’s module leaders.
	* Students will have a Dissertation Supervisor from the Data Science team and in cases where that is the Course Leader, an independent Personal Tutor will also be appointed so that all students have the opportunity for independent pastoral and academic advice.
	* The Course Leader and/or Personal Tutor will meet with Data Science students regularly to provide guidance on assessment and personal development choices, discuss progress on the course, career plans, goals, development and recognition of personal and graduate attributes.

The assessment during the Professional Placement year will include a reflective practice piece of work supported by evidence of achievement, and the employer’s appraisal. The performance and attendance will be regularly monitored through the placement year. The marking of the placement is “pass” or “fail”.

1. **Support for Students and their Learning**

Postgraduate students are supported by:

* + A detailed induction programme in the first week of enrolment which includes mathematics and programming background diagnostics and support for students with diverse academic backgrounds. For example:
		- Students’ programming experience is explored during induction. Diagnostic self-assessment and self-directed learning materials for introductory Python have been developed within the in-house *Nooblab* system to prepare students unfamiliar with Python for the CI7520 *AI* module.
		- A mathematics and statistics “refresher” course is available following induction, as for other CSM postgraduate programmes.
	+ SEC Academic Success Centre (SASC), which supports students in their academic skills, English language, assessment and feedback interpretation*,* through daily drop-ins as well as online through the VLE (Canvas). For CSM students in particular (but open to all) SASC incorporates:
		- Programming Aid for drop-in software development support; and
		- MathsAid for mathematics and statistics support.

Both are run by CSM academic staff or postgraduate & PhD students.

* + - Advice on generic study skills is also available on the VLE (Canvas), to which all students have access; this includes advice on writing, oral communication, numeracy, problem-solving and career management, amongst others.
	+ The Course Leader-led Personal Tutor Scheme aims to help students in their studies, with a combination of staff and peer support. It is recognised that students studying the MSc Data Science come from a variety of backgrounds, including those who are in employment, returning to study after a break, recent graduates from Kingston University and other UK institutions and international students. These various experiences and backgrounds contribute to the peer support built into the Personal Tutor Scheme. At the beginning of the year and throughout, tutors and students will discuss: available resources to help students getting started at Kingston University and transitioning from undergraduate to postgraduate study; maths aid, employability, *CV* and cover letter writing, and ‘skills gap analysis’; academic progress during studies, including formative and summative feedback and how this can be used to feed-forward to improve performance; and preparation for the research project.
	+ Students are encouraged to discuss academic and pastoral concerns with their Course Leader. All academic staff operate a system of open office support hours during which students can consult with their lecturers. Additional assistance is also available through the Union of Kingston Students, the Dyslexia and Disability Support Office, and the Careers & Employability Service.
	+ Elected/appointed Student Representatives who can report to the Student Staff Consultative Committee meetings with feedback from students on the course specific to the modules and the course in general.

Additional support is available for students undertaking a placement.

* While the responsibility for finding and securing a professional placement rests ultimately with the students, those who are intending to undertake a placement are supported by a comprehensive structured programme of activities and events designed to help them. This starts with an additional separate day of induction at the start of the course (over and above the induction for other students) – introducing some of the fundamentals of career development and job-hunting, as well as the place of the professional placement module within the academic structure. After induction students follow, over a few months, a scheduled programme of assignments (built into the module structure in Canvas) including personal awareness/development portfolio, *CV* writing, and commercial awareness research, combined with webinars and workshops on such things as building a personal brand in LinkedIn as well as networking events. This is supported by a placements team within the Faculty who, in addition to helping source potential placement job opportunities and expanding the University’s pool of employer contacts, work with students to help them utilise the resources available and complete the assignments. In addition, staff from the University’s Careers and Employability team introduce all of their facilities and resources and also work with the students in one-to-one sessions e.g. for *cv* review. As well as acting as consultants, support staff also visit the students in timetabled sessions for ‘maximum exposure’ and students who have completed the placement in the past are also invited back for presentations and Q & A sessions.
* The appropriateness of placement positions is vetted by the Course Leader and while out on placement students are supported by a placement tutor who monitors progress and visits the students on site.
* The aim from start to finish is to ensure that students have a successful and rewarding placement experience which develops their knowledge and skills and prepares them for higher levels of employment.
1. **Ensuring and Enhancing the Quality of the Course**

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

* External examiners
* Student-Staff Consultative Committees (SSCC)
* Boards of Study with student representation
* Annual Monitoring and Enhancement
* Internal Subject Review undertaken at subject level
* Student evaluation including MEQs
* Moderation policies
* Feedback from employers
1. **Employability Statement**

Data Science spans computing and mathematics subject areas. Qualifications in these disciplines are amongst the most versatile and enable graduates to find employment in a wide spectrum of careers ranging from systems and business analysts, through to programmers and network specialists in a wide range of public and private sector industries, as well as within specific Data Science and closely-related roles. During the course, students will have gained proficiency and knowledge in applied programming, statistics and visualisation and common industrial software environments that will enhance employment and lifelong learning opportunities in this area. Recent graduates from CSM’s postgraduate courses have found employment with large organisations such as IBM, Hewlett Packard, Capgemini, JDA Software, Thomson Reuters, GlaxoSmithKline, Axa, BAA, British Telecom, Ernst & Young, Marks & Spencer, Waitrose, Virgin Media, NHS Institute for Innovation and Improvement as well as a host of smaller companies. Graduates also pursue careers in academia joining universities such as Kingston University’s PhD programmes in digital imaging, network security, and user experience.

Students’ employability skills are developed throughout the course, through activities that are embedded within the syllabus and from the University’s Careers and Employability Service. During induction week students are encouraged to reflect on and identify what they have previously learned, whether academically or in terms of transferable skills, and how these may be relevant to their choice of subject discipline and employment opportunities. They are also encouraged to explore the job market and possible career paths at an early stage of the course, and to consider attributes that employers look for in graduates above and beyond essential academic skills. The students are then encouraged to continue to build on the key skill attributes learnt from their previous education and experiences, and focus on the importance of the following KU graduate attributes that are particularly relevant to Data Science: Creative and original thinking, being inventive and experimental, finding original solutions to problems, influencing change, being more resilient and self-aware and able to consider their actions in the context of the wider community. As the course progresses, students are further encouraged to develop clearer ideas about career options and are offered assistance and guidance in the preparation of a CV and for job applications and interviews. For students already in employment the course offers an opportunity to enhance their knowledge and to develop their practical, intellectual and key skills to assist them in their career development, obtaining recognition for current and acquired skills.

1. **Approved Variants from the Undergraduate or Postgraduate Regulations**

Compensation is not permitted in modules at Level 7. All Level 7 modules must be passed with a mark of at least 50%.

1. **Other sources of information Students may wish to consult**

The British Computer Society (The Chartered Institute for IT) <https://www.bcs.org>

The Institute for Mathematics and its Applications <https://ima.org.uk>

The Royal Statistical Society <https://www.rss.org.uk>

The Institute for Apprenticeships and Technical Education Data Scientist (Integrated Degree) Level 6 specification <https://www.instituteforapprenticeships.org/apprenticeship-standards/data-scientist-integrated-degree/>

QAA Subject Benchmark Statement <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements> for [Computing](https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-masters-degree-computing.pdf?sfvrsn=c490f681_16) and [Mathematics](https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-mathematics-15-masters.pdf?sfvrsn=7891f681_20) at master’s level (Data Science is akin to other joint courses combining aspects of computing, mathematics and statistics).*.*

**Development of Field/Course Learning Outcomes in Modules**

This map identifies where the field/course learning outcomes are **summatively** assessed across the modules for this field/course. It provides an aid to academic staff in understanding how individual modules contribute to the field/course aims, a means to help students monitor their own learning, personal and professional development as the field/course progresses and a checklist for quality assurance purposes.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Module code** | CI7320 | CI7330 | CI7340Applied Data Programming | CI7520Machine Learning and Artificial Intelligence | CI7000Project Dissertation | CI7900Professional Placement(∼ depending on particular placement role)  |
| **Knowledge & Understanding** | A1 |  | ✓ | ✓ | ✓ | ✓ | ∼ |
| A2 | ✓ | ✓ |  |  | ✓ | ∼ |
| A3 | ✓ |  | ✓ |  | ✓ | ∼ |
| A4 | ✓ | ✓ |  | ✓ | ✓ | ∼ |
| A5 |  | ✓ |  | ✓ |  | ∼ |
| A6 |  |  |  |  |  | ✓ |
| **Intellectual Skills** | B1 | ✓ | ✓ | ✓ | ✓ | ✓ | ∼ |
| B2 | ✓ |  |  |  | ✓ | ∼ |
| B3 |  | ✓ | ✓ | ✓ | ✓ | ∼ |
| B4 |  | ✓ |  | ✓ | ✓ | ∼ |
| B5 |  |  |  |  | ✓ | ∼ |
| B6 |  |  |  |  |  | ✓ |
| **Practical Skills** | C1 | ✓ | ✓ | ✓ | ✓ | ✓ | ∼ |
| C2 |  | ✓ |  |  | ✓ | ∼ |
| C3 |  | ✓ | ✓ | ✓ | ✓ | ∼ |
| C4 | ✓ |  |  |  | ✓ | ✓ |
| C5 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.**

**Assessment Calendar**

This table indicates the weeks that summative assessments will be published and when they will be due to be submitted or sat (exams)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module Title** | **Assessment Element** | **Brief published** | **Submission Week** | **Feedback Week** |
| **Level 7** |
| CI7320 Databases and Data Management | Coursework 1Coursework 2 | Module’s first taught week | In-between taught weeks | Within 3 weeks\* |
| CI7520 Machine Learning and Artificial Intelligence  | Coursework 1Coursework 2 | Module’s first taught week | In-between taught weeks | Within 3 weeks\* |
| CI7330 Data Analytics and Visualisation  | Coursework 1Coursework 2 | Module’s first taught week | In-between taught weeks | Within 3 weeks\* |
| CI7340 Applied Data Programming  | Coursework 1Coursework 2Presentation | Module’s first taught week | In-between taught weeks, and (cwk2) with feedback from presentation | Within 3 weeks\* |
| CI7000 Project Dissertation | Project proposalDissertation*Viva*/demonstration | Week 1 | Summer Teaching BlockFinal Teaching BlockEnd of Final Teaching Block | Within 4 weeks |
| CI7900 Professional Placement | Professional Portfolio | Week 1 | At the end of the placement | Within 4 weeks |

\* In SEC’s week-block delivery model, coursework assignments briefs are normally discussed with students at the start of the appropriate week and submitted in time for formative feedback to be given in advance of the next teaching week or exam period, as appropriate.

**Technical Annex**

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| **Final Award(s) and Title(s):** | MSc Data ScienceMSc Data Science with Professional Placement |
| **Intermediate Award(s):** | PgDip, PgCert |
| **Minimum period of registration:** | 1 year (FT), 2 years (with placement), 2 years (PT), |
| **Maximum period of registration:** | 2 years (FT), 3 years (with placement), 4 years (PT) |
| **FHEQ Level for the Final Award:** | Masters award level 7 |
| **QAA Subject Benchmark:** | *All subject benchmark statements can be found* [*here*](http://www.qaa.ac.uk/quality-code/subject-benchmark-statements)*. For PG provision where there is no QAA subject benchmark make reference to the* [*QAA Master’s Degree Characteristics*](http://www.qaa.ac.uk/quality-code/the-existing-uk-quality-code/part-a-setting-and-maintaining-academic-standards)*.*[Computing](https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-masters-degree-computing.pdf?sfvrsn=c490f681_16) and [Mathematics](https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-mathematics-15-masters.pdf?sfvrsn=7891f681_20) at master’s level |
| **Degree Apprenticeship standard:** | N/A |
| **Modes of Delivery:** | Full-time, part-time |
| **Language of Delivery:** | English |
| **Faculty:** | Faculty of Science, Engineering and Computing |
| **School:** | School of Computer Science and Mathematics |
| **Department:** | Computer Science |
| **UCAS Code:** | N/A |
| **Course/Route Code:** |  |
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1. Franklin, C., *et al.* (2016) “Guidelines for assessment and instruction in statistics education (GAISE) report” *American Statistical Association*. [↑](#footnote-ref-2)