

AQH-B2-3b Postgraduate Programme Specification Template

February 2014

Postgraduate Programme Specification Template

- Standard text is in grey highlight;

SECTION A: CORE INFORMATION

1. Name of programme

Data Science

2. Award title

MSc in Data Science
Post Graduate Diploma in Data Science
Post Graduate Certificate in Data Science

3. Programme linkage

Is this part of a group of linked programmes between which students can transfer at agreed points? (eg a group of programmes with a common set of taught modules)

 No

If yes:

This programme is one of a group of related programmes which also includes (add titles):

It is possible to transfer between these programmes at certain points. This may be subject to particular requirements.

4. Is the programme a top-up only?

 No

5. Level of award: (Level 7 only)

Level 7

6. Awarding body: **University of Sunderland**

7. Which department is it in?

Computing, Engineering and Technology

8. Programme Studies Board:

Computing Postgraduate

9. Programme Leader:

Dr David Nelson

10. How and where can I study the programme?

Tick all boxes that apply

At Sunderland:	
Full-time on campus	X
Part-time on campus	X
As work-based learning full-time	
As work-based learning part-time	
As a full-time sandwich course	
As a part-time sandwich course	
By distance learning	

At the University of Sunderland London campus:	
Full-time on campus	
Part-time on campus	
As work-based learning full-time	
As work-based learning part-time	
As a full-time sandwich course	
As a part-time sandwich course	
By distance learning	

At a partner college:	
Full-time in the UK	
Part-time in the UK	
Full-time overseas	
Part-time overseas	
By distance learning	
As a full-time sandwich course in the UK	
As a part-time sandwich course in the UK	
As a full-time sandwich course overseas	

As a part-time sandwich course overseas	
As work-based learning full-time in the UK	
As work-based learning part-time overseas	
Other (please specify)	

11. How long does the programme take?

	Min number of years / months	Max number of years / months
Full-time	14 months	
Part-time	24 months	
Distance learning		
Work-based learning		

For start-dates please see the current edition of the Prospectus or contact the relevant department at the University. For start-dates for programmes delivered in a partner college, please contact the college.

SECTION B – FURTHER CORE INFORMATION

Use Outline Programme Proposal Form for ADC [\(AQH-B2-2\)](#), for questions 12 to 22

23. Learning and teaching strategy.

The general learning, teaching and assessment strategy used within this programme reflects the Faculty standard for postgraduate taught programmes and embraces the Faculty Learning and Teaching Plan. The fact that the MSc in Data Science is dealing with graduates and educating them to Masters level means that the students are expected, and have the ability, to carry out a significant quantity of independent study. This may take the form of directed reading of research papers and advanced technical material, applied practical work utilising the tools and techniques appropriate to Data Science and the resolution of Big Data problems.

The programme is designed to enable students to learn about the principles, theories, and practices associated with Data Science and to apply these in a series of exciting and innovative ways. The programme encourages students to learn from leading researchers and practitioners in Data Science and as such lectures are underpinned with the opportunity to solve real world data science problems, where possible these will be set from industrial and business contexts and case studies. The case studies will be derived from collaborative partnerships, for example from the NHS, Sunderland Council, Accenture, Northumbria Police, HPE and more. The intention is to give students an environment to explore and understand the Data Science issues, identify opportunities

to utilise and apply Data Science principles and techniques, and prepare students for career development in the Data Science domain.

Negotiated learning is mainly used within the project module of this programme, but some of the assessment topics for modules (eg “Big Data in Organisations”) will be negotiated between students and tutors. In the project module, the negotiation will centre on the terms of reference that the student wishes to propose. A central objective within the terms of reference of PROM01 will be the delivery of the product or artefact required by the client. However, the route by which this is achieved, and the topic and scope of the research that will interlink with it, are decided under negotiation between the student and supervisor (these decisions will be ratified during project reviews).

24. Retention strategy. *Describe any particular initiatives not described elsewhere (eg in student support section) to support student retention.*

Support and guidance is offered to students through a comprehensive set of mechanisms in order to address retention. In addition to the details provided in the student support section retention on the MSc Data Science programme will be addressed via student support and guidance, access to programme leader and module leaders, induction, programme information (via programme handbook), access to student services and pastoral support.

All students have access to their Programme and Module Leaders as appointments can be made with staff. Students’ problems generally will be dealt with through the Programme Leader. The students also have representation on the Boards of Studies and the Staff Student Liaison Committees. Programme Leaders meet regularly with their tutees to take soundings and obtain feedback on various issues, and to talk to students individually to provide important academic guidance.

All students have access to a personal tutor. At postgraduate level the students’ personal tutor is their programme leader. Students can request to speak to their programme leader in confidence regarding any personal issues. In the case where a student for example would feel uncomfortable speaking with their programme leader (for example a female student may wish to speak with a female member of staff) then the programme leader will attempt to arrange for the student requests to be met as soon as possible.

All on-campus students have access to the University’s central support services including Counselling, Disability Service, Health and Well-being, Chaplaincy, financial support and advice, International Office and Careers and Employability Service. The Students’ Union provides an independent service which offers advice and support across the full range of personal and academic problems which students may encounter. Students wishing to lodge a complaint or an appeal can seek advice from the Students’ Union or from Academic Services. Full details of all these services can be found on the University’s web-site. Where appropriate, academic or support staff in the Faculty will sign-post students to these specialist services.

25. Any other information

The programme has been designed to incorporate the University's principles and expectations of "inclusive programme design" in particular taking into account the requirements and availability of learning materials in hard copy / printed copy and online (taking into account W3C standards) – alternative formats will be signposted. All teaching and learning activities (see below) are designed to be inclusive by anticipating the most common problems that students with wide ranging levels of abilities may face. The teaching on the programme will embrace the principles of inclusive design for example making whole module sets of material available in advance for students, use of vocabulary lists, facilitating recording of sessions, etc. The resources to be used on the programme comply with disability access requirements for University buildings – mainly in David Goldman Informatics Centre.

The Department utilises central disability to assess all students who require on an individual basis to ensure that appropriate support is identified and that a schedule is implemented to provide support as necessary.

SECTION C - TEACHING AND LEARNING

26. What is the programme about?

The aims of the programme are to:

Provide you with advanced knowledge of Data Science topics and specialist areas such as data mining, machine learning, data visualization and security of Big Data, including state of the art techniques, programming toolkit, and industrial and societal application scenarios.

Develop your research skills applicable to a career as a data scientist in industry or subject specialism or academia.

Stimulate your interest in the numerous applications of Data Science, including social media, business intelligence, Big Data, and the contextualized use of Data Science, Big Data.

27. What will I know or be able to do at the end of the programme?

Learning Outcomes Postgraduate Certificate – Skills

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **S1** Independently and objectively, critically review, consolidate and extend their knowledge to produce a systematic and coherent body of information in the context of Data Science
- **S2** Work independently and make objective decisions relating to complex Data Science, Big Data problems
- **S3** Utilise and exploit the range of opportunities afforded by Big Data in specific contexts and settings

Learning Outcomes Postgraduate Certificate – Knowledge

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **K1** undertake a thorough appraisal and understanding of a broad range of current methods and concepts at the forefront of Data Science, including the Big Data life cycle
- **K2** develop a thorough and critical understanding of a key aspects of Data Science as an academic discipline
- **K3** critically apply appropriate research techniques with reference to studying Data Science
- **K4** understand at a conceptual level the theoretical underpinnings of Data Science

Learning Outcomes Postgraduate Diploma – Skills

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **S4** design, build and evaluate complex ecosystems required in Data Science applications using a wide range of methods, tools, techniques, languages and platforms for data storage, data analysis, data analytics and visualization of Big Data
- **S5** create robust Big Data application environments and integrate them with supporting architectures and infrastructures
- **S6** evaluate the risks and commercial opportunities associated with the use of Data Science tools and techniques applied to Big Data sets
- **S7** apply creativity and innovation to Big Data and Data Science problems and opportunities

Learning Outcomes Postgraduate Diploma – Knowledge

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **K5** have a critical awareness of the legal, professional, ethical, social and security issues associated with Big Data systems
- **K6** an appreciation of how architectures, infrastructure, operating systems, platforms and software interoperate to support Data Science and Big Data applications
- **K7** critically evaluate the data storage technologies utilised in Data Science including their use to maximise the opportunities afforded by Big Data

Learning Outcomes Masters – Skills

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **S8** design and undertake independently, a major research project on a topic which relates to the forefront of the academic discipline of Data Science and reflect extensively and objectively on method, process and outcomes
- **S9** independently conduct research or advanced technical or professional activity on a project whose title is in the domain area of Data Science demonstrating self-

direction and originality in tackling and solving problems, and critically evaluating sources

- **S10** deal with complex issues in Data Science both systematically and creatively, make informed judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences

Learning Outcomes Masters – Knowledge

By the end of this part of the programme successful students should know, understand or be able to do the following:

- **K8** critically apply management concepts and techniques, including the use of advanced tools for the management of Data Science projects
- **K9** apply advanced knowledge in a highly specialised area, application or specialism in the discipline of Data Science, via an individual project

28. What will the programme consist of?

Taught postgraduate programmes generally consist of a number of taught modules leading to the award of a Postgraduate Certificate (60 credits) or Postgraduate Diploma (120 credits). A Masters qualification (180 credits) usually culminates in a major piece of independent work such as a project or dissertation. All modules are at postgraduate level (level 7 in the UK's national scheme). The summary below describes briefly what is contained in the programme. The programme structure, including a detailed list of modules, can be found in the [programme regulations](#).

The Masters in Data Science provides you with a thorough grounding in the analysis and use of large data sets, data analytics, data visualization, together with experience of conducting a development project, preparing you for responsible positions in the Big Data and related IT industries. Data Science provides a huge opportunity to harness new forms of data with increasingly powerful computer techniques which will increase operational efficiency, improve services and provide better insights for decision making and policymaking. This programme will develop skills and knowledge to provide graduates with the confidence to use Data Science tools and techniques to be innovative in using Data Science, solve Big Data Problems, create opportunities for analytics and visualization and enable effective and efficient use of Big Data. The schedule of modules is provided in appendix 4.

CETM11 – Research Skills and Academic Literacy. This 15 credit module is taken by students on all Masters programmes in the department. The module is designed to prepare students for two critical activities related to academic discourse that are key requirements for programmes at this level: reading effectively and writing critically and effectively. These are key skills that will prepare students for critical reading and writing required not only in the other taught modules of the programme, but also in the 60 credit project module (PROM01) that all students take in the Masters stage of their programme.

CETM23 – Big Data in Organisations. In this 15 credit module students will learn to apply the principles of data science to determine the benefits of utilising Big Data sets in organisational

settings. Students will develop techniques and use tools that will enable them to undertake critical analysis of the challenges and opportunities of using Big Data sets in context.

CETM24 – Data Science Fundamentals. In this 30 credit module students will learn how to different types of data, including how to fuse more than one dataset together. They will apply a full gamut of traditional and intelligent analytics on a variety of datasets and make use of modern Data Science/Big Data platforms and languages. Techniques and tools for presenting and visualization will be covered.

CETM25 – Data Visualisation. The 15 credit module on data visualisation will cover a range of topics associated with Big Data. The module will covers the challenges of Big Data analysis from a visualisation perspective, examining trends in Big Data visualisation, the principles of data visualisation, the cycle of visualisation and the visualisation workflow, risks in Big Data visualisation (including misrepresentation and misunderstanding). The practical components of the module will focus on data discovery tools and the development of visual literacy.

CETM26 – Machine Learning and Data Mining. The 15 credit module introduces the challenges of Big Data in pattern extraction and knowledge discovery, and provides an overview of machine learning and data mining technologies. This is followed by a series of topics of machine learning and data mining including learning theory, learning problem, data integration, data cleaning, data representation, feature extraction and selection for dimension reduction, classification, clustering, association and pattern mining, Linear and Logistic regression, deep learning, and reinforcement learning.

CETM27 – Data Analytics. The 15 credit module is split into two related parts. The first part of the module examines features of Data Warehouses including how they are designed, developed, implemented and maintained in order to support Data Analytics in organisations and how they have evolved to support Big Data. The second part of the module will focus on the theory and practical applications of Data Analytics. It will introduce Data Analytics formalisms and investigate various types of Data Analytics such as Descriptive, Prescriptive, Diagnostic and Predictive Analytics.

CETM28 – Big Data Security. In this 15 credit module students will learn to analyse the range of trade-offs in balancing the security properties of confidentiality, integrity and availability and the usability demands of Big Data. They will have the opportunity to learn how to manage concepts of risk, threats, vulnerabilities and potential attacks in the context of Big Data. Students will be able to explain, apply and evaluate the concepts of trust and trustworthiness in a Big Data environment and explain and apply the issues associated with authentication, authorization and access control.

Students who pass 60 credits (normally CETM11, CETM23 and CETM24) are eligible for a Postgraduate Certificate in Data Science. Students who pass CETM24 and 2 other modules from the Diploma stage may be eligible for PG Cert. Students who pass an additional 60 credits (CETM25, CETM26, CETM27 and CETM28) are then eligible for a Postgraduate Diploma in Data Science.

The final part of the MSc programme consists of a 60 credit project module PROM01. In this module the student will develop a practical deliverable as well as investigating an area of academic research that informs the practical aspect of the project. Wherever possible the project will have a

real client, who may come from either inside or outside of the institution (possibly utilising learning analytics), and has a need for a real practical deliverable in the Data Science and Big Data domains.

PG Cert, PG Diploma and MSc requirements are summarised in the table below. Full detail of module name and assessment are available in the appendices.

Post Graduate Certificate in Data Science	To obtain PG Certificate students need to pass CETM24 (30 credits)	Plus 2 15-credit modules from CETM11, CETM23, CETM24, CETM25, CETM26 and CETM27
Post Graduate Diploma in Data Science	To obtain PG Diploma students need to pass CETM11, CETM23, CETM24, CETM25, CETM26 and CETM27	
MSc in Data Science	To obtain MSc students need to pass all modules for PG Diploma and also the 60 credit project module PROM01	

29. How will I be taught? Modes of teaching and learning aligned with KIS – choose one or more

Scheduled teaching activities	X
Independent study	X
Placement	

Students will be given the opportunity to study the range of Data Science programmes in a variety of different approaches. The topics in the various modules will be normally be introduced through a series of lectures led by academics who are active researchers in the subject matter and supported by guest lecturers from business and industry. Students will have the opportunity to understand tools and techniques in Data Science, develop skills in a range of topics including analytics, visualisation and machine learning through applied exercises a series of seminar / tutorial and practical activities. Students will have the opportunity to apply Data Science principles to real world Big Data challenges and problems. The programme will develop the students' research skills by encouraging them to participate in research into Big Data security topics, deliver research seminars and present the findings of their research. Students will have the opportunity to explore the subjects in depth through guided independent study. A key approach to teaching and learning utilised in the MSc Data Science is Problem Based Learning (PBL) (drawing on the pedagogic experience in the department – currently there is a Higher Education Academy research project on PBL being run in the department giving the students the opportunity to examine Data Science subjects using innovative pedagogy.

The objective of the students-staff contact time in lectures is to introduce theories, concepts case studies and scenarios and to set milestones and learning goals, and make new ideas and concepts accessible to the students. These ideas are then followed up in tutorials and in the students' own time. Tutorials / seminars and laboratory activities are used within each module to provide support for lectures – giving students the opportunity to apply theoretical concepts to practical problems – many of these practical problems will be set in collaboration with industrial and business partners to the University including Sagezza, IBM, Accenture, HPE, Geek Talent, Sunderland NHS Trust and Sunderland City Council. The prime objectives of tutorial time are to allow in-depth study of

particular topics that have been introduced and also for practical exercises. As well as requiring a significant amount of individual study, the course also encourages group working. This is in recognition of the fact that a graduate of the course will normally be employed in environments where significant demands will be made upon his or her ability to co-operate and collaborate with others.

In addition students are expected, and have the ability, to carry out a significant quantity of independent study. Students will be supported in developing the skills to do this for example in CETM11, 'Research Skills and Academic Literacy', CETM23, 'Big Data in Organisations', and CETM24 'Data Science Fundamentals'. This may take the form of directed reading of research papers and advanced technical material, research activities, or practical work on various software problems and packages. The level of independence increases throughout the programme culminating in the project module, PROM01 where students have the opportunity to demonstrate knowledge and skills from the taught modules and take them to a higher level.

As well as developing skills and abilities in the domain of Data Science students will have the opportunity to develop masters level skills, including, but not limited to: research skills (across all modules); gathering and using information (particularly in data analytics); synthesising information/data; applying methodologies, applying concepts, creating new concepts/ideas/products, analysing and evaluating, critical reasoning, and information retrieval skills.

Throughout the programme, across all modules, students will be encouraged to take into account professional, ethical, social and legal constructs in the context of Data Science and Big Data. In the Data Science project students will have the opportunity to apply legal, ethical, social and professional issues (LSEPIs) when designing their project study and use LSEPIs to underpin the approach and all communication with the client. The professional body (British Computer Society) expectations are embedded throughout the programme – which will help with any students seeking to develop their careers by obtaining chartered status (CITP or CEng).

A list of the modules in the programme can be found in the [Programme Regulations](#).

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the [Matrix of Modes of Teaching](#).

30. How will I be assessed and given feedback?

Written examinations	
Coursework	X
Practical assessments	X

A summary of the types of teaching, learning and assessment in each module of the programme can be found in the [Matrix of Modes of Teaching](#).

The generic assessment criteria which we use can be found [here](#). Some programmes use subject-specific assessment criteria which are based on the generic ones.

This programme uses the Generic University Assessment Criteria	YES	NO
This programme uses the Subject Specific Assessment Criteria	NO	YES

The University regulations can be found [here](#).

The assessment throughout this programme is a mixture of methods appropriate to the modules under study. Each assessed 15 credit module will typically have one or two assessments, while 30 credit modules will typically have three assessments as a maximum.

The students experience a diverse range of assessment strategies across the programme, enabling them to display various skills associated with Masters level learning. This will include research papers, tutorial design, analysis of Data Science and Big Data problems, application of Data Science tools and techniques, formal paper reviews, and presentations. The assessment strategies chosen within each module are appropriate to the content and style of delivery and have been further selected in order to provide a rich mixture of diverse assessment strategies while ensuring that the module aims and objectives can be accurately assessed.

Individual assignments include different forms of assessment strategies. The CETM11 Research Skills and Academic Literacy module is assessed by a portfolio which includes a comparative review of two published research papers, and a research report where the students establish a research question and produce an abstract, introduction and outline methodology for an experiment relevant to the programme. Formative assessment is an important part of this module and includes an element whereby the students critically evaluate each other's work. The modules CETM23 Big Data in Organisations, CETM27 Data Analytics, and CETM28 Big Data Security include an assessment where students produce either a research report or essay on a relevant topic. In CETM24, Fundamentals of Data Science students complete a number of exercises both practically oriented as well as containing short written critical review and evaluation reports.

Every attempt is made to ensure that the assessments are based on real world problems and challenges with assessments briefs being developed in collaboration with industrial and business partners where appropriate and as such have relevance to employers and help develop employability criteria for students. Examples of relevant, real world applications can be seen in examining issues around the developing competitive advantage from Big Data 'Big Data in Organisations', how to make efficient use of Big Data in 'Data Visualisation' and how to examine and evaluate Big Data in 'Data Analytics'. All of these examples will encourage output from the assessment which can be used and applied in the workplace either directly by students or in the form of reports / recommendations etc for work based clients.

The project module PROM01 encompasses a wide range of assessment styles whereby students produce a practical deliverable for a real client, a substantial and methodical research report which informs development of the practical deliverable and which must be relevant to the programme, a thorough evaluation of all stages of the project, and documentation evidencing project management and control of a substantial project.

31. [Teaching, learning and assessment matrix](#)

See Appendix 2

32. How does research influence the programme?

The Faculty of Applied Science in general and the Department in particular is committed to the close coupling of research and teaching activities so that our research underpins the teaching we deliver. Research active staff are involved in the delivery of teaching across the complete range of our programmes. We actively map teaching teams to modules based on the relevance of their current activities and previous experience. The resulting cross-fertilisation of research and teaching means that our modules remain current in a rapidly developing field.

The MSc programme in Data Science is heavily influenced by the research interests of the academics involved in the delivery of the modules. All of the academics who are designated module leaders were returned in the most recent REF. Academic expertise in Data Science, data analytics, visualisation, machine learning, statistics and cybersecurity are embedded throughout the modules on the programme and underpin the learning outcomes of the MSc. Current research projects will be utilised to provide case studies and examples in the research active curriculum. Research specialisms and interests from colleagues in the department teaching on the programme include (but are not limited to): novel techniques for managing and discovering knowledge in Big Data sets; using Big Data to address cybercrime; Big Data and cybersecurity, Big Data challenges in digital forensics, data visualisation tools and techniques, effective and efficient data warehousing, and techniques for enhancing data analytics. Examples of current projects include NHS Trust data analytics in the use of social media to gather and analyse Big Data; using Big Data to enable preventative policing with regional police forces; visualisation of Big Data in collaboration with Sunderland City Council and ethical standards of Big Data usage.

The MSc in Data Science is heavily influenced by research both in terms of inclusion of research interests of academic staff and collaborative projects with industrial partners. The department has a strong track record of Knowledge Transfer Partnerships as a means of formalising applied research.

The department has recently recruited a new Professor of Data Science who joins the delivery team for the MSc. The new member brings an international perspective to Data Science research and Data Science development with particularly strong links to China and the very interesting Data Science challenges facing that country.

We have a proud history of direct involvement from our students within our research activities. Masters projects are actively sourced from research areas in the department and the University and recent publications have featured project work undertaken by students who have been included as named authors. Students have the opportunity to develop their research skills in a number of ways including as researchers through student led seminars, applying research (PROM01) and becoming part of the research community in the department. Students will have the opportunity to participate in the Department's Research Seminar Series where one of the most active strands of the series focuses on Big Data.

SECTION D EMPLOYABILITY

33. How will the programme prepare me for employment?

The programme gives you the opportunity to develop advanced skills and knowledge which you can use in the future. Some postgraduate programmes are associated with a particular career path but most skills can be applied to a range of employment situations. The skills which this programme is designed to develop are listed below.

The speed at which individuals, businesses, organisations and governments are generating data is increasing at an unprecedented rate. Feedback from employers suggest that there is a significant skills gap in Data Science – there is a need for skilled professionals to make sense of the huge amount of data being generated by information systems, the Internet, mobile technologies, social media and the Internet of Things. Gathering Big Data, preparing Big Data for use (giving structure to unstructured data), wrangling Big Data, analysing using data analytics, visualising and making sense of big data requires a professional with an understanding, awareness and ability to apply a set of new methods and techniques. The MSc in Data Science seeks to develop graduates who will become proficient data scientists with the technical knowledge base and skills set to master the complex problems and complex data requirements emanating from Big Data. The programme will enable graduates to utilize the constantly changing and evolving modern technologies that continuously reshape the way digital interaction and communication takes place. Recent government reports such as **UK Commission for Employment and Skills** (2013) suggests that the digital sector will require nearly 300,000 new recruits by 2020 and one of the key findings in the report suggests that specialist demand will include “high level IT specialisms, such as IT Architects, Data and Security specialists”. The McKinsey Report (2011) “following the 'Big Data' boom, there is a clear and continuing shortage of individuals who are able to fulfill the Data Scientist role (McKinsey, 2011). Rather than skills gap being addressed or the demand for data scientists to fall, “ the demand for people with data science skills is predicted to double over the next five years”.

The MSc Data Science programme has been designed in collaboration with employers in the region, including, Sagezza, IBM, Accenture, HPE, Sunderland NHS Trust, Sunderland City Council, BA and Sage. One of the primary motivations for developing the Data Science programme was to address the skills gap in Data Science and Big Data in the region. The programme learning outcomes, the content of the programme and the content and curriculum for each module has been designed in order to address the subject specific needs of employers. Each module has included a definition of the transferrable skills that are specifically developed in the individual modules. The transferable skills have been designed to enhance the employability of students.

Discussions with employers have identified three key employability categories. The programme has been designed in such a way as to enable graduates to enter each of the following category types.

- 1 Manager – needs high level understanding or principles of Big Data and what it is that Big Data can provide for the organisation.
- 2 Technical Professional – this type of professional is primarily concerned with making sense of the technical opportunities in Big Data and Data Science. In many respects this is very similar to a statistician (and may be one) but knows the practical Big Data details of working with data that aren't taught in the statistics curriculum: data cleaning, methods for dealing with very large data sets, visualisation, deep knowledge of a particular domain, writing well about data, and so on. In addition this type of job may involve design and development

(taking into account programming and coding) of Big Data systems and implementation of Big Data infrastructures and architectures.

- 3 Analytical Professional – this type of professional shares some statistical background with the technical professional. This type of professional is mainly interested in using data “in production”. They build models which interact with professionals, often serving recommendations and helping to understand and exploit the opportunities associated with data analytics and use of Big Data.

The department of Computing, Engineering and Technology works closely with the University’s central Careers and Employability Service to ensure that students have access to career opportunities, specialist talks and support and guidance for career development. For full time students there is a commitment to supporting students in their progression from education to work. For part time students support is given to help with career development and career progression. The Careers and Employability Service is located in the Gateway, an impressive, newly-renovated facility in the centre of the City Campus.

For information about other opportunities available to our students who study on campus, click [here](#).

Additional opportunities to develop your experiences more widely will vary if you study at one of our partner colleges. For information about the extra-curricular activities available in any of our colleges please contact the college direct.

34. Particular features of the qualification. (optional)

35. Professional statutory or regulatory body (PSRB) accreditation. *Choose one of the following.*

PSRB accreditation is not relevant to this programme	
PSRB accreditation is currently being sought for this programme	X
This programme currently has PSRB accreditation	

The programme is currently accredited until: Initial accreditation will be sought in May 2017, however it should be noted that it will not be possible to have programme accredited until at least 3 students have graduated from the programme.

The relevant PSRB(s) is/are:

British Computer Society

The terms of the accreditation are as follows:

Initial accreditation will be sought in May 2017 (this is the next BCS Accreditation visit)

The programme is recognised as:

Partially meeting the requirement for Chartered IT Professional

The programme is accredited dependent on:

Successful completion of 180 masters credits

This depends upon successful completion of the programme.

There are no programme-specific regulations relating this award.

The modules to be studied	n/a
Pass-marks for some or all modules and/or parts (elements) of modules	n/a
Placement requirements	n/a
Attendance requirements	n/a
Professional practice requirements	n/a
Final or overall mark for the award	n/a
Other	n/a

Interim or exit awards are not accredited.

SECTION E PROGRAMME STRUCTURE AND REGULATIONS

Use [Programme Regulations Form](#), for questions 36 and 37

See Appendix 1

SECTION F ADMISSIONS, LEARNING ENVIRONMENT AND SUPPORT

38. What are the admissions requirements?

Entry point (delete those not required)	Standard entry requirements ¹	Entry with advanced standing ²	Other ³
Level 7 (Masters awards) – start of programme	An honours degree (2:2 or above) or equivalent in a computing or related non-computing discipline (mathematics, statistics, engineering) or an honours degree	Not applicable	Students who have 5 years relevant business or industry experience

	(2:1 or above) in relevant non-computing or related degree (degree which has numeracy included and / or application of big data as a significant theme).		
Level 7 (Masters awards) – after Certificate	Not applicable	Not applicable	
Level 7 (Masters awards) – after Diploma	Not applicable	Not applicable	

Applicants whose first language is other than English must fulfil the University's minimum language skills requirement through one of the accepted mechanisms.

The University's standard admissions requirements can be found in the [university regulations](#). Programme-specific requirements which are in addition to those regulations are given below.

Can students enter with advanced standing?	Yes	No
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The University has a process by which applicants whose experience to date already covers one or more modules of the programme they are applying for may seek Accreditation of Prior Learning (APL). Full details can be found [here](#) but if you think that this may be relevant to you, please contact the department which offers the programme you are interested in.

APL and APEL are not normally applied in this programme

39. What kind of support and help will there be?

a. in the department: describe the student support in place in the department/ faculty

The overall strategy for support and guidance is three-pronged: accessibility to staff and resources; provision of relevant and reliable information and operation of a responsive system for managing problems as they arise.

Support and guidance is offered to students through a comprehensive set of mechanisms. All new students are given a week-long induction programme during which time they are exposed to various aspects of student academic life and much information on the University and its Services, the Department and their chosen programme of study. They are provided with programme information, talks by programme and module staff, library visits, talks by representatives from a number of important student services such as the International Office and the University language Scheme including English for Academic Purposes for students whose first language is not English.

All students have access to their Programme and Module Leaders as appointments can be made with staff. Students' problems generally will be dealt with through the Programme Leader. The

students also have representation on the Boards of Studies and the Staff Student Consultative Committees. Programme Leaders meet regularly with their tutees to take soundings and obtain feedback on various issues, and to talk to students individually to provide important academic guidance.

Library facilities for students are provided across both campuses and offer an innovative learning environment, an electronic environment which offers access to online resources, the campus network and the Internet, and areas for group and individual study. A summary of the major features of the Web provision, which will be available to the students, is given below:

- complete staff list, telephone numbers, Email addresses and module responsibilities;
- complete list of Department programmes, modules with links to programme structures and module descriptors;
- generic student handbook including links to Department home pages, University sites e.g. Student Services, Careers, Information Services, Campus maps and various Department and University policy documents e.g. rules on infringement, the Modular Credit Scheme and Teaching & Learning policies;
- health & Safety advice.
- the use of Sunspace (on-line learning environment) to act as a student support and feedback mechanism.

All students have access to a personal tutor. At postgraduate level the students' personal tutor is their programme leader. Students can request to speak to their programme leader in confidence regarding any personal issues. In the case where a student for example would feel uncomfortable speaking with their programme leader (for example a female student may wish to speak with a female member of staff) then the programme leader will attempt to arrange for the student requests to be met as soon as possible.

b. in the university as a whole:

The University provides a range of professional support services including [health and well-being](#), [counselling](#), [disability support](#), and a [Chaplaincy](#). Click on the links for further information.

c. in a partner college:

Please see the relevant college prospectus or website for details of student support if you are planning to study in one of our partner colleges.

40. What resources will I have access to?

On campus	x	In a partner college		By distance learning	
-----------	---	----------------------	--	----------------------	--

On campus

Tick all that apply

General Teaching and Learning Space	X
IT	X
Library	X
VLE	X

Laboratory	X
Studio	
Performance space	
Other specialist	
Technical resources	

In terms of our teaching staff, the module leaders have been chosen with regard to their expertise in the subject area and in many cases they, and their teaching team, are working on relevant research and/or external engagement projects. This enables staff to practice research informed teaching thus providing students with an appreciation of relevant research themes, an idea of where and how the subject is developing in the future and, in many cases, “real world” case studies. External speakers are solicited from collaborating companies and our own recent graduates in order to provide students with access to relevant practitioners who can provide industrial context.

The list of module leaders involved in the delivery of this programme can be seen in Appendix 3.

The Department makes full use of the University’s Virtual Learning Environment (SunSpace) and our strategy is for every module and programme to have an online presence. Key features of our current SunSpace provision include:

- complete staff list, telephone numbers, Email addresses and module responsibilities;
- complete list of Department modules with links to detailed module descriptors and, in many cases on-line learning resources;
- general student handbook including links to Department home pages, University sites e.g. Student Services, Careers and Employability Service, Information Services, Campus maps and various Department and University policy documents e.g. rules on cheating and collusion, the Modular Credit Scheme and Teaching & Learning policies;
- Department/Programme/Module timetables
- Department Standards
- A Code of Conduct for Use of the Computing Terraces
- Health & Safety advice
- Information about the Department’s research activities

Library facilities available at St Peters include a dedicated computing subject collection, a comprehensive range of electronic resources, open access areas for group and individual study, and dissertations / research working papers from the department are also housed in the library.

The Learning Resource Centre for St Peter’s Campus is integrated into the St Peters library opposite to the David Goldman Informatics Building. This provides a wide range of facilities including document scanning, laser and colour printing, photocopying, self-study space for the consultation of reference sources, and the sale of low-cost course materials and stationery items.

Specialist Resources

All students in the Department are provided with access to one of the most modern and best equipped computing environments in the UK. The David Goldman Informatics Centre features an open plan area made up of terraces which contain nearly 250 workstations comprising PCs and

MACs. The computers on the terraces are installed with all the necessary software packages required and are normally available to the students on an open access basis 7:00am until 9:00pm weekdays. 24 hour computing facilities are available at the Murray Library.

In support of independent study, students are provided free access to the Internet for their smartphones, tablets and laptops via a university wide wireless network. A range of free software is also made available to students through volume licensing with partners such as Adobe, Symantec, Microsoft and Cisco.

There are specialist hardware (including a 40 core grid computer, Dell R920 60 core processor, 1 G RAM & high capacity storage) and software resources for the MSc Data Science programme which will enable students to understand the relationship between hardware and software in Big Data management examining how Big Data are stored and how processed. The facilities will allow students to work with, manipulate and analyse Big Data sets. Students will have access to appropriate Data Science software such as Hadoop, Greenplum, Mongo, Objectivity, MapReduce, Pig, R, HBase and Hive. Where possible virtual machines will be utilised to enable students to apply the tools and techniques for Data Science.

The MSc in Data Science is one of the building blocks for the University's planned Institute for Big Data Innovation. When the Institute is opened (planned for 2017) students on the MSc Data Science will be able to make use of the new resources offered in the Institute.

The Enterprise Place is supported by the Sunderland Software City initiative and provides dedicated rooming and facilities to host entrepreneurial activities in Data Science. Students with business ideas can become resident in Enterprise Place as they attempt to grow from ideas on how exploit Data Science and Big Data to fully formed businesses.

Information about the University's facilities can be found [here](#).

Please see the relevant college prospectus or website for details of college learning resources if you are planning to study in one of our partner colleges.

41. Are there any additional costs on top of the fees?

No, but all students buy some study materials such as books and provide their own basic study materials.	<input checked="" type="checkbox"/>
Yes (optional) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are additional costs for optional activities associated with the programme (see below)	
Yes (essential) All students buy some study materials such as books and provide their own basic study materials. In addition there are some are essential additional costs associated with the programme (see below)	

42. How are student views represented?

All taught programmes in the University have student representatives for each programme who meet in a Student-Staff Liaison Committee (SSLC) where they can raise students' views and concerns. The Students' Union and the faculties together provide training for student representatives. SSLCs and focus groups are also used to obtain student feedback

on plans for developing existing programmes and designing new ones. Feedback on your programme is obtained every year through module questionnaires and informs the annual review of your programme. Student representatives are also invited to attend Programme and Module Studies Boards which manage the delivery and development of programmes and modules. Various Faculty committees, particularly Faculty Student Success Committee, Academic Development Committee and Quality Management Sub-Committee also have student representation. This allows students to be involved in higher-level plans for teaching and learning. There is a parallel structure at university level on which students are represented by sabbatical officers who are the elected leaders of the Students' Union. The University's student representation and feedback policy can be found [here](#).

Every two years we participate in the national Postgraduate Taught Experience Survey (PTES) which is run by the Higher Education Academy.

Programmes offered in partner colleges: If you are studying in one of our partner colleges the college will have its own mechanisms for obtaining student feedback. Some of these may be the same as those on-campus at the University but others may be different. You should ask your college for further information.

For distance learning operated from Sunderland: if you are studying by distance learning you will have slightly different arrangements from those used on campus. In particular you are likely to have virtual rather than physical meetings and discussions. However these arrangements should provide comparable opportunities for you to give feedback. Details are given below.

A summary of the major features of the Web provision, which will be available to the students, is given below:

- complete staff list, telephone numbers, Email addresses and module responsibilities;
- complete list of Department programmes, modules with links to programme structures and module descriptors;
- generic student handbook including links to Department home pages, University sites e.g. Student Services, Careers, Information Services, Campus maps and various Department and University policy documents e.g. rules on infringement, the Modular Credit Scheme and Teaching & Learning plans and policies;
- health & safety advice.
- the use of Sunspace (on-line learning environment) to act as a student support and feedback mechanism.

SECTION G QUALITY MANAGEMENT

43. National subject benchmarks

The Quality Assurance Agency for Higher Education publishes benchmark statements which give guidance as to the skills and knowledge which graduates in various subjects and in certain types of degree are expected to have. They do not cover all subjects at postgraduate level but those which exist can be found at [here](#).

Are there any benchmark statements for this programme?	YES	NO
--	------------	-----------

The subject benchmark(s) for this programme is/are:

Masters Computing Benchmark

The QAA also publishes a Framework for Higher Education Qualifications (FHEQ) which defines the generic skills and abilities expected of students who have achieved awards at a given level and with which our programmes align. The FHEQ can be found [here](#).

44. How are the quality and standards of the programme assured?

The programme is managed and quality assured through the University's standard processes. Programmes are overseen by Module and Programme Studies Boards which include student representatives. Each year each module leader provides a brief report on the delivery of the module, identifying strengths and areas for development, and the programme team reviews the programme as a whole. The purpose of this is to ensure that the programme is coherent and up-to-date, with suitable progression through the programme, and a good fit (alignment) between what is taught and how students learn and are assessed - the learning outcomes, content and types of teaching, learning and assessment. Student achievement, including progress through the programme and the way in which the final award is made, is kept under review. The programme review report is sent to the Faculty Quality Management Sub-Committee which in turn reports issues to the University's Quality Management Sub-Committee (QMSC) and Academic Development Committee (ADC).

External examiners are appointed to oversee and advise on the assessment of the programme. They ensure that the standards of the programme are comparable with those of similar programmes elsewhere in the UK and are also involved in the assessment process to make sure that it is fair. They are invited to comment on proposed developments to the programme. Their reports are sent to the Deputy Vice-Chancellor (Academic) as well as to the Faculty so that issues of concern can be addressed.

All programmes are reviewed by the University on a six-yearly cycle to identify good practice and areas for enhancement. Programmes are revalidated through this review process. These reviews include at least one academic specialist in the subject area concerned from another UK university. The University is subject to external review by the Quality Assurance Agency for Higher Education on a six-year cycle. Their review reports for Sunderland can be found at [here](#).

Further information about our quality processes can be found [here](#).

Please also complete the [SITS form](#).

PART B - PROGRAMME REGULATION/S**Name of programme:** Data Science**Title of final award:** MSc**Interim awards¹:** Post Graduate *Certificate in Data Science*; Post Graduate *Diploma in Data Science*

Students who pass 60 credits (which must include 'Data Science Fundamentals' CETM24) are eligible for a Postgraduate Certificate in Data Science. Students who pass all the taught modules on the programme are eligible for a Postgraduate Diploma in Data Science.

Accreditation:

MSc Data Science to seek initial BCS accreditation

The PG Certificate and PG Diploma awards are not accredited.

University Regulation (please state the relevant University Regulation): 4.2.1

Regulations apply to students commencing their studies from (please state the date / intake that these regulations will apply to students for each Stage):

Regulations apply to students	Date the regulations apply	Intakes affected
Stage 1		
Stage 2		
Stage 3		
Stage 4	From September 2016	

Stage 4**Core modules:**

Code	Title	Credits
CETM11	Research Skills and Academic Literacy	15
CETM23	Big Data in Organisations	15
CETM24	Data Science Fundamentals	30
CETM25	Data Visualisation	15
CETM26	Machine Learning and Data Mining	15
CETM27	Data Analytics	15
CETM28	Big Data Security	15
PROM01	Masters Project	60

Optional Modules

¹ Same as main award unless agreed otherwise at validation – eg to meet PSRB requirements

MSc	None
Post Graduate Diploma	None
Post Graduate Certificate	CETM11, CETM23, CETM25, CETM26, CETM27, CETM28

Elective Modules

None

Progression Regulations

There are no programme-specific progression regulations²

² This will be the norm – university regulations apply

MATRIX OF MODES OF TEACHING, LEARNING AND ASSESSMENT

CODE	TITLE	CORE / OPTION	MODES OF T&L	MODES OF ASSESSMENT	SKILLS LEARNING OUTCOMES									
					S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
CETM11	RESEARCH SKILLS AND ACADEMIC LITERACY	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK	TDA	TDA	TDA					TD	TD	
CETM23	BIG DATA IN ORGANISATIONS	CORE	LECTURES, SEMINARS, TUTORIALS, SELF STUDY	COURSEWORK	TDA	TDA	TDA	TD	T	T	T	TDA	T	TDA
CETM24	DATA SCIENCE FUNDAMENTALS	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	TDA	TDA	TDA	D	D	T	T		TDA	TD
CETM25	DATA VISUALISATION	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	D	D	D	TDA	TD	TDA	TDA			T
CETM26	MACHINE LEARNING AND DATA MINING	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK			D	TDA	TDA	TDA	TDA			T
CETM27	DATA ANALYTICS	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	D	D		TDA		TDA	TDA		D	T
CETM28	BIG DATA SECURITY	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK	D	D		D	TDA	TDA	TD		D	T
PROM01	PROJECT	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK	D	D	D	DA	DA	D	TDA	TDA	TDA	TDA

CODE	TITLE	CORE / OPTION	MODES OF T&L	MODES OF ASSESSMENT	KNOWLEDGE LEARNING OUTCOMES									
					K1	K2	K3	K4	K5	K6	K7	K8	K9	
CETM11	RESEARCH SKILLS AND ACADEMIC LITERACY	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK		TD	TDA	TDA	TDA			TD	TD	
CETM23	BIG DATA IN ORGANISATIONS	CORE	LECTURES, SEMINARS, TUTORIALS, SELF STUDY	COURSEWORK	TDA	TA	DA	TDA	TDA			TDA	T	
CETM24	DATA SCIENCE FUNDAMENTALS	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	TDA	TDA	TDA	TDA	TD	TD	TD	TD	TDA	
CETM25	DATA VISUALISATION	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	D	D		TD	TD	TDA	TDA			
CETM26	MACHINE LEARNING AND DATA MINING	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	D	D		D	TDA	TDA	TDA	TD		
CETM27	DATA ANALYTICS	CORE	LECTURES, PRACTICALS, TUTORIALS, SELF STUDY	COURSEWORK	D	TD	D	D	D	TDA	TDA	TDA	TD	
CETM28	BIG DATA SECURITY	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK	D	D			TDA	TDA	TDA	TD		
PROM01	PROJECT	CORE	LECTURES, TUTORIALS SELF STUDY	COURSEWORK	A	D	TD				TDA	TDA	TDA	

NOTE – THE PROJECT MODULE PROM01 SPECIFICALLY ADDRESSES THE PROGRAMME LEARNING OUTCOMES S9, S10 AND K9 AND STUDENTS WOULD NOT BE AWARDED THE MSc WITHOUT PASSING THIS MODULE.

**QUICK REFERENCE**

Panel: External Internal
 Programme: New Review Title Change
 Replacement for existing

SITS SUMMARY PROGRAMME/SHORT COURSE DETAILS

(FORM TO BE COMPLETED ELECTRONICALLY BY THE FACULTY AND FORWARDED TO THE QUALITY ASSURANCE AND ENHANCEMENT (QAE) QUALITY OFFICER SUPPORTING THE APPROVAL EVENT, OR SENT TO MANAGEMENT INFORMATION AND SYSTEMS DEVELOPMENT (MISD) FOR FACULTY DEVOLVED PROCESSES BEFORE SENDING TO QAE)

<u>PROGRAMME/SUBJECT/SHORT COURSE DETAILS</u>	
<u>EXIT AWARD: TITLE OF PROGRAMME/AWARD</u>	MSC DATA SCIENCE, PG DIPLOMA DATA SCIENCE, PG CERTIFICATE DATA SCIENCE
<u>IF REPLACEMENT FOR EXISTING, SPECIFY TITLE OF OLD</u>	
<u>FACULTY(IES):</u>	APPLIED SCIENCES
<u>DEPARTMENT:</u>	COMPUTING, ENGINEERING AND TECHNOLOGY
<u>SITS PROGRAMME/SHORT COURSE CODE³</u>	
<u>PROGRAMME STUDIES BOARD⁴</u>	POSTGRADUATE COMPUTING
<u>UCAS CODE⁵ (IF APPLICABLE). IF OTHER PLEASE STATE METHOD.</u>	
<u>JACS CODE⁶</u>	G400
<u>QUALIFICATION LEVEL / QUALIFICATION AIM</u>	MASTERS
<u>MODES OF DELIVERY AND DURATION:</u>	(DELETE YES/NO AS NECESSARY) FULL TIME YES/NO 14 MONTHS SANDWICH YES/NO YEARS PART TIME YES/NO 24 MONTHS WORK BASED LEARNING YES/NO ON-CAMPUS YES/NO OFF-CAMPUS YES/NO
<u>CSP ONLY. OTHER SUBJECT COMBINATIONS NOT ALLOWED WITH THIS SUBJECT:</u>	
<u>PROGRAMME/SUBJECT/SHORT COURSE LEADER:</u>	DR DAVID NELSON
<u>DATE OF APPROVAL /MODIFICATION/REVIEW</u>	
<u>DATE OF NEXT REVIEW (QAE TO COMPLETE)</u>	
<u>START DATE OF PROGRAMME/SHORT COURSE</u>	SEPTEMBER 2016
<u>NUMBER OF INTAKES PER ANNUM AND LIKELY MONTH(S) INTAKE(S) STARTS.</u>	1 – SEPTEMBER

<u>FUNDING DETAILS</u>	
<u>CONFIRM FUNDING ARRANGEMENTS FOR PROGRAMME E.G. HEFCE/TDA/NHS/OTHER⁷</u>	
<u>IF IT IS TDA, IS IT PRIMARY/SECONDARY/F.E./OTHER</u>	

³ To be allocated in consultation with MISD team in Planning and Finance

⁴ Programme Studies/Assessment Board that will have management responsibilities for the programme.

⁵ Please contact Admissions Manager for code

⁶ JACS code = e.g. (V1) History, (G5) Computing Science, etc. for information contact relevant Faculty Associate Dean (See QAA Website http://www.qaa.ac.uk/WorkWithUs/Documents/jacs_codes.pdf)

⁷ Please confer with Amanda Watson for funding status for programme

(PLEASE STATE)	
IS THE PROGRAMME OPEN OR CLOSED⁸:	OPEN

ACCREDITING BODY	YES/NO IF YES PLEASE ATTACH COMPLETED FORM AQH-CIII2 BRITISH COMPUTER SOCIETY (SEE APPENDIX 5)
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PROGRAMME SPECIFIC REGULATIONS	ARE THERE TO BE PROGRAMME SPECIFIC REGULATIONS? YES/NO IF YES, PLEASE ATTACH COMPLETED FORM AQH-B3 APPENDIX 2 OR AQH-B8.
---------------------------------------	---

COLLABORATIVE: PLEASE COMPLETE DETAILS	UK YES/NO OVERSEAS YES/NO
INSTITUTION	COLLABORATIVE MODEL⁹ FUNDING ARRANGEMENTS¹⁰
.....
.....
.....

INTERIM AWARD SCHEDULE

INTERIM AWARD TITLE	CREDITS REQUIRED	INTERIM STRUCTURE PLEASE SHOW MANDATORY REQUIREMENTS IF APPLICABLE E.G. CORE MODULE CODES
PG CERTIFICATE IN DATA SCIENCE	60	CETM24 AND 2 FROM CETM11, CETM23, CETM25, CETM26, CETM27, CETM28
PG DIPLOMA IN DATA SCIENCE	120	CETM11, CETM23, CETM24, CETM25, CETM26, CETM27, CETM28

DETAILS SUPPLIED BY: **DATE:**

⁸ An Open programme constitutes an open admissions policy. A Closed programme is normally specific to one client only. If in doubt please consult Academic Services or Planning and Finance.

⁹ As per QAE guidelines

¹⁰ Please contact Amanda Watson for confirmation of funding details

MODULE LIST

AWARD, ROUTE (IF APPLICABLE) AND LEVEL	NEW/EXISTING/ MODIFIED MODULE (N/E/MM)	MODULE TITLE	MODULE CODE	MODULE CREDIT VALUE	WHETHER CORE OR OPTION	MUST CHOOSE (IE DESIGNATED OPTION):	ASSESSMENT WEIGHTING – GIVE % WEIGHT FOR EACH ASSESSMENT ITEM	PRE-/CO-REQUISITES	MODULE LEADER	OTHER COMMENT (IF REQUIRED)	DATE OF ENTRY ON SITS. N/MM ONLY (AFTER EVENT)	JACS CODE
TAUGHT (CERT/ DIP)	E	RESEARCH SKILLS AND ACADEMIC LITERACY	CETM11	15	CORE		001 COURSEWORK (30%) 002 COURSEWORK (70%)	-	LYNNE HUMPHRIES			G400
	N	BIG DATA IN ORGANISATIONS	CETM23	15	CORE		001 COURSEWORK (100%)	-	ALASTAIR IRONS			G400
	N	DATA SCIENCE FUNDAMENTALS	CETM24	30	CORE		001 COURSEWORK (30%) 002 COURSEWORK (20%) 003 COURSEWORK (50%)	-	KEN MCGARRY			G400
	N	DATA VISUALISATION	CETM25	15	CORE		001 COURSEWORK (100%)	-	MING JIANG			G400
	N	MACHINE LEARNING AND DATA MINING	CETM26	15	CORE		001 COURSEWORK (70%) 002 COURSEWORK (30%)	-	YONGHONG PENG			G400
	N	DATA ANALYTICS	CETM27	15	CORE		001 COURSEWORK (100%)	-	DAVID NELSON			G400
	N	BIG DATA SECURITY	CETM28	15	CORE		001 COURSEWORK (100%)	-	ALASTAIR IRONS			G400

Appendix 5

												G400
MSc	E	PROJECT	PROM01	60	CORE		100% COURSEWORK: 20% DISSERTATION 30% RESEARCH 30% SUCCESS AND EVALUATION 10% PLANNING REVIEW 10% VIVA	-	DAVID NELSON			G400

MSc Data Science Delivery Schedule

Full Time programme

Semester 1

CETM26 Data Science Fundamentals (30) – new

CETM11 Research Skills and Academic Literacy (15) – existing

CETM23 Big Data in Organisations (15) – new

Semester 2

CETM25 Data Visualisation (15) – new

CETM26 Machine Learning and Data Mining (15) – new

CETM25 Data Analytics – new

CETM28 Big Data Security (15) – new

PROM01 Project (60) – existing (continues in semester 3)

Semester 3

PROM01 Project (60) - existing

Part time Schedule

Year 1 Semester 1

CETM26 Data Science Fundamentals (30) – new

Year 1 Semester 2

CETM25 Data Visualisation (15) – new

CETM26 Machine Learning and Data Mining (15) – new

Year 2 Semester 1

CETM11 Research Skills and Academic Literacy (15) – existing

CETM23 Big Data in Organisations (15) – new

Year 2 Semester 2

CETM25 Data Analytics – new

CETM28 Big Data Security (15) – new

Year 2 Semester 2 and 3

PROM01 Project (60) – existing

**AQH-Ciii2 Programme Accreditation Information checklist re Professional, Statutory, Regulatory Body (PSRB)
Version 3.0 November 2014**

Part A needs to be completed when there is any change in the PSRB contact details.

Part B.1 or B.2 (see note on page 2) needs to be completed when there is any change in Accreditation status or a new programme is submitted to a PSRB for Accreditation. The Accreditation report should also be appended to this form.

Part B.3 needs to be completed to provide dates of the award and when the accreditation was reported to F/QMSC

Part A: PSRB details

Body Name: British Computer Society – The Chartered Institute for IT	
Body Acronym: BCS	
Will the accreditation be reported to HESA in the KIS return	
Yes	
What is the HESA Accrediting body code	Please use the number from the first column on the list provided by HESA: 011
Address: Block D, North Star House, Swindon	
Post Code: SN2 1FA	
Primary Contact: Title: Ms First Name: Maxine Surname: Leslie Role: Head of BCS Accreditation	

<p>Phone: 44 (0) 1793 417 698</p> <p>Email: Maxine.leslie@bcs.uk</p> <p>Accreditation URL: www.bcs.org</p>
--

Part B: Programme Accreditation - The following information is required for **each** Programme/Course that the PSRB accredits.

<p>Body Acronym: BCS</p>

Part B.1 – complete this section if the accreditation will be reported to HESA/KIS

<p>Sunderland Programme/Course:</p>	
<p><i>The full Title of the Programme/Course. If the Accreditation is for only part of the course list the details of modules and/or stage in this section</i></p>	<p>MSc in Data Science</p>
<p><i>State the SITS Programme/Course code</i></p>	
<p>What is the HESA Accreditation type (ACCTYPE) 01103</p>	<p>Please use the list provided by HESA: Accredited by BCS, the Chartered Institute for IT for the purposes of partially meeting the academic requirement for registration as a Chartered IT Professional.</p>

Part B.3

Programme/SC Leader: Dr David Nelson	
Staff member responsible for liaising with PSRB: Professor Alastair Irons	
Date PSRB Accreditation Awarded: seeking interim award in May 2017	
Period of Accreditation: 'not approved' until first cohort has graduated	
From: 01./09/2016 To: 31/08/2021	
Interim review 1: 17 MAY 2017	Interim Review 1 Date: <i>if applicable</i>
Interim Review 2: <i>if applicable</i>	Interim Review 2 Date: <i>if applicable</i>
Notes:	
Date Accreditation Reported to Faculty Quality Management sub-committee:	
Date Accreditation Reported to Quality Management sub-committee:	