

Programme Specification

A Programme Specification provides a concise summary of the main features of a programme and its intended learning outcomes. It is intended to be used by prospective students, current students, academic staff and potential employers.

Programme Title:	
BSc (Hons) Data Science BSc (Hons) Data Science with Foundation Year	
Programme (AOS) Code(s):	BB1DSC1 (3 years) BB1DSC4 (4 years)
UCAS Code:	DSC1 for 3-year version DSC4 for 4-year version
Name of Final Award:	Bachelor of Science with Honours, BSc (Hons)
Level of Qualification:	Level 6
Regime of Delivery:	Attendance
Mode(s) of Delivery:	Full Time
Typical Length of Study (Years):	3 years, not including Foundation Year 4 years, including Foundation Year
Professional Body Recognition / Accreditation (including specific requirements where applicable):	Not applicable

Brief Description of the Programme

Data science can be described simply as the study of data. It involves developing methods of recording, storing, and analysing data to effectively extract useful information. Large amounts of complex data can be exposed to statistical analysis and computational processing to disclose meaningful information that supports decision-making. Data scientists are in high demand because they can interrogate data and use different analytics to find patterns, trends and relationships in data sets. Their assessment of big data can reveal interpretations and insights that can be utilised in many contexts, with just some examples highlighted here – businesses can predict and capitalise on consumer behaviour; banking institutions are becoming more savvy when it comes to fraud detection; investors can use a combination of big data and artificial intelligence to make more informed investment choices; pharmaceutical companies are using data analysis to accelerate the development of promising drugs.

The BSc (Hons) Data Science programme gives you a strong grounding in the technologies and systems that underpin the secure storage, sharing, analysis and presentation of data in various situations for different purposes. This will include a broad computing education in computer architectures, networks, information security, programming, databases, Web technology and software engineering. Data analysis will naturally represent a central theme on the course. Technologies, information systems and different associated components will then be used to transform data into significant information so that stakeholders can report findings and make evidence-based decisions. You should then expect to explore areas such as data warehousing, big data, business intelligence, data visualisation, intelligent systems and statistical methods, as part of your impactful data science education.

The final stage of the programme, Level 6, provides options for different specialisation pathways. Depending upon what has inspired you during your course, and perhaps motivated by future career ambitions, you can potentially select modules that concentrate on either database development, or, artificial intelligence, or, cloud computing and network security. The Project gives each individual student an opportunity to carry out a unique in-depth investigation of a topic of their interest, and to further develop their skills in research, problem solving and critical analysis.

Programme Aims

1	Provide students with an in-depth understanding of the different dimensions of the field of data science
2	Equip students with relevant technical skills and experience in the use of different technologies, systems, approaches and methodologies relevant for the secure storage, communication, analysis and presentation of data
3	Develop students who can systematically and critically analyse the different methods and strategies for addressing various data-related problems in order to devise and implement appropriate solutions
4	Instil in students a range of transferable skills to make effective contributions in the workplace, to take responsibility for their continuing personal and professional development and to be lifelong learners
5	Develop an appreciation of professional, moral, legal and ethical issues involved generally in computing and information technology and more specifically in relation to the handling and management of data

Programme Learning Outcomes

The Bucks Graduate Attributes focus on the development of innovative leaders in professional and creative capacities, who are equipped to operate in the 21st Century labour market and make a positive impact as global citizens. The attributes are developed through the programme.

ID	Learning Outcome
On successful completion of the programme a graduate will be able to:	
Graduate Attribute: Knowledge and its application (K)	
K1	Understand the relevant principles, practices, tools and methods within data science that can then be appropriately and systematically applied to given problems and situations
K2	Be able to apply computer technology and systems to a variety of tasks, problems and projects
K3	Implement project management skills to the building of databases, development of systems, solving problems and completing other tasks, to meet the relevant requirements and timescales
K4	Explain the mathematical and statistical methods that support the effective analysis of different types of data
K5	Recognise the business, industrial and commercial contexts in which computer systems are used to undertake the analysis, modelling and utilisation of data
Graduate Attribute: Creativity (C)	
C1	Can objectively analyse the advantages and disadvantages of different technologies and methods, as potential approaches for completing given tasks

C2	Creatively deploy tools and techniques learned on the programme, and using a variety of thought processes, to address a range of diverse problems
C3	Critically assess the success of applying innovation to the solution of simple and complex projects, revealing information that can be used by self and others when addressing future challenges
C4	Demonstrate adaptability and flexibility in response to new, changing and unpredictable situations
Graduate Attribute: Social and ethical awareness and responsibility (S)	
S1	Behave in an honest and ethically responsible way, showing respect to others
S2	Implement the necessary data protection principles, including the appropriate use of computers and technology, such that information is used fairly, lawfully and transparently
S3	Adhere to any principles and guidelines of conduct applicable to professional practice, such as integrity, confidentiality, competence and fairness, providing support to colleagues and acting properly towards clients and others
Graduate Attribute: Leadership and self-development (L)	
L1	Take responsibility for the identification, planning, realising and recording of one's own continuing personal and professional development in educational and workplace contexts
L2	Recognising the different roles within a team, able to make different and appropriate contributions to a collaborative project, according to the nature of the problem and the skill set within the group
L3	Effectively communicate information in different formats, be it verbal interaction or written documentation, in a clear and professional manner, to meet the needs of the task and audience
L4	Utilise lessons learned from successes and mistakes, and use constructive feedback from others, to improve and develop self

Programme Structure

Programmes are structured in stages. The number of stages will vary depending on the mode (e.g. full-time, part-time), duration and location of study which will be detailed in the Programme Handbook.

Modules are set at a specific academic level and listed as either core (compulsory) or optional. The level indicates the relative academic difficulty which will increase through the programme. Passing modules will reward you with academic credit. The amount of credits will depend on the complexity of the module and the level of effort required, which is measured in 'notional learning hours'.

Our [Academic Advice webpages](#) provide more information on the structure of taught awards offered by the University.

Please note: Not all option modules will necessarily be offered in any one year. Other option modules may also be introduced at a later stage enabling the programme to respond to sector developments.

Foundation Level (Optional for students on degree programmes)

Code	Module Title	Credit	Core / Option	Compensable (Normally Yes)
FY026	Preparing for Success: Knowledge and Creativity	N/A	Core	Yes
FY027	Preparing for Success: Self Development and Responsibility	N/A	Core	Yes
FY028	Inquiry Based Learning	N/A	Core	Yes
FY006	Digital Media	N/A	Core	Yes
FY007	Computing Essentials	N/A	Core	Yes

Level Four

Code	Module Title	Credit	Core / Option	Compensable (Normally Yes)
CO450	Computer Architectures	15	Core	Yes
CO452	Programming Concepts	15	Core	Yes
CO405	Database Design	15	Core	Yes
CO456	Web Development	15	Core	Yes
CO451	Networking	15	Core	Yes
CO453	Application Programming	15	Core	Yes
CO406	Data Warehousing	15	Core	Yes
CO454	Digital Technologies & Professional Practice	15	Core	Yes

Level Five

Code	Module Title	Credit	Core / Option	Compensable (Normally Yes)
CO550	Web Applications	15	Core	Yes
CO524	Big Data	15	Core	Yes
CO506	Information Security	15	Core	Yes
CO525	Business Intelligence	15	Core	Yes
CO526	Data Presentation and Visualisation	15	Core	Yes
CO527	Statistical Methods	15	Core	Yes
CO557	Software Engineering	15	Core	Yes
CO559	Intro to Intelligent Systems (Team Project)	15	Core	Yes

Level Six

Code	Module Title	Credit	Core / Option	Compensable (Normally Yes)
CO699	Project	30	Core	No
CO617	Data Science	15	Core	Yes

CO656	Database Development	15	Option	Yes
CO652	Knowledge-Based Systems in A.I.	15	Option	Yes
CO654	Cloud Computing	15	Option	Yes
CO618	Legal Aspects of IT	15	Core	Yes
CO657	Database Technologies	15	Option	Yes
CO653	Learning Machines & Intelligent Agents	15	Option	Yes
CO655	Network Security	15	Option	Yes

Learning and Teaching Activities

Please see the [Academic Advice pages](#) for a description of learning and teaching activities that are recognised by the University. Detailed information on this specific programme is outlined below:

Modules on this programme will be taught in line with best practice across the university and in the sector. A variety of approaches, and good use of the latest technology, will be blended together to engage students in learning inside class and beyond, and to encourage full student participation. Meanwhile, the Course Team will strive to ensure that all modules embrace current industrial practice wherever possible.

The teaching and learning strategies employed throughout the course are those judged to be the most appropriate for each module at each stage and level of the course. The strategies have been designed to ensure that there is an evolution from formal teaching through to student-centred and independent learning, as a student progresses and develops through the different levels of the course.

A range of teaching methods will be used including:

Lectures

This is the most formal teaching strategy employed in teaching the modules. It is generally used to deliver a body of theoretical information to a large group of students and is most effective when followed up by a seminar or tutorial session to consolidate learning.

The lecture format may be supported by written hand-outs, Web or library references which serve to reinforce and expand the audio-visual information presented. In addition, staff will make appropriate use of the VLE (Virtual Learning Environment - Blackboard) facilities. This should enable lecturers to enhance the traditional communication and learning media, as well as making material available to students at home and on the university campus.

Tutorials / Practical Sessions

Often in smaller groups, tutorials are guided learning sessions, which can either support a formal lecture by students working through tutorial sheets with the help of a lecturer or by students working through practical exercises in, say, a computing room.

Seminars

These can vary from large group seminars, which provide an opportunity for the student-led formal debate of particular topic areas, to 'impromptu' discussion sessions with smaller groups,

which may, for example, follow the showing of a video. Other techniques, such as industrial visits, guest lectures and computer-aided learning tools will be used where appropriate. This variety of techniques is aimed at stimulating student learning. The teaching and learning strategies for individual modules are detailed in the relevant module pro-formas.

Additional Course Costs

There are costs associated with all studies, additional to the tuition fee, which require consideration, when planning and budgeting for expenditure. Costs are indicative and for the total length of the course shown unless otherwise stated and will increase with inflation; depending on the programme they may include equipment, printing, project materials, study trips, placement activities, DBS and/or other security checks.

The university will provide access to the appropriate facilities and equipment to allow you to do your course. However, a student on this course may find it useful to have their own computer or laptop, so that they can work flexibly at home and elsewhere, if necessary. Whilst it is difficult to be exact, other common annual costs can be:

- Text books - £100 to £150 per year
- Software - £200 to £250 per year
- Printing - £30 to £50 per year

Contact Hours

1 unit of credit is the equivalent of 10 notional learning hours. Full time undergraduate students study 120 credits (1200 hours) and full-time postgraduate students study 180 credits (1800 hours) per year or 'stage' of the course.

Course Stage	Scheduled Activities (Hours)	Guided Independent Study (Hours)	Placement / Study Abroad / Work Based Learning (Hours)
Foundation Year	336	864	0
Year One	360	840	0
Year Two	360	840	0
Year Three	360	840	0

Assessment Methods

The [Assessment and Examination webpages](#) provide further information on how assignments are marked and moderated, including a description of assessment activities. These also include further information about how feedback on assessed work is provided to students, including our commitment to ensure this is provided to students within 15 working days (the 'three-week turnaround').

Assessment Strategies

A variety of assessment vehicles will be used as appropriate to the different modules, including assignments carried out in the student's own time, in-class assignment, workshops, presentations and formal examination. The form of assessment has been chosen so as to motivate students to

achieve their best, and create learning activities for the students. The assessment vehicles for individual modules are detailed in the module descriptors.

Assessments will be appropriate to the task, achievable, motivating and vocationally-focused and will form a constructive part of the learning process.

Assessments will develop general transferable skills as well as academic skills.

Assessments will provide sufficient opportunity for the best students to exhibit a level of innovation and creativity associated with excellence.

During the Foundation Year, students will be exposed to a variety of summative and formative assessments whilst developing the academic skills to be a successful student at university; course content and Learning Outcomes strongly relate to students developing their knowledge and understanding of the subjects being studied and assessed.

Level 4 assessments will be primarily formative and will encourage the development of appropriate academic practice and concepts. The emphasis will be on frequent small-scale assessments wherever possible with a balance between formative and summative assessment.

Level 5 assessments will be more demanding, with the emphasis still on development of knowledge, skills, and concepts but now encouraging learning at greater depth, emphasising the fundamental principles. There will be a shift towards summative assessment.

Level 6 assessments are designed so as to allow students to demonstrate their knowledge and skills so that they have become effective, independent learners. The emphasis is on summative assessment.

Advice, Feedback and Collaborative Learning

Assessment is an integral part of the education process, promoting student learning by providing a focus for consolidating, applying and demonstrating understanding of the subject matter. The listed summative assessment regime essentially measures and grades learner development and achievement in relation to the intended Learning Outcomes. It also generates feedback information for students about the strengths and weaknesses in their work, with tutors affirming what students have done well whilst giving constructive and encouraging advice about areas requiring reflection and further improvement.

In fact, tutor feedback on formal assessment elements is just part of the ongoing dialogue with students about their learning and personal development. Tutors will offer students frequent opportunities to discuss their progress, where their work can be examined and reviewed, including the evaluation of plans and drafts for assignments prior to submission. This supportive engagement helps to clarify what “good performance” is, with reference to published criteria and expected standards; it also encourages, motivates and directs students towards achieving their full potential.

Different strategies for timely advice and effective feedback will be adopted, according to what is fit-for purpose for students and modules. For instance: good or bad examples of previous student work not only give students clues about appropriate content, structure and presentation of assignments but also highlight common mistakes and omissions; mock exam papers and formative tests; work portfolios represent a collection of structured activities completed over a

period of time with regular interactions with the tutor; individual and group tutorials; practising presentations with other students can invite peer review; model answers can supplement and extend the feedback given on assessments; group discussions can promote reflection and collaborative learning; audio and video recordings can be used at various points to explain topics and to give guidance; other technology (such as the VLE) can facilitate information sharing, and support learning and collaboration.

Classification

Calculation of final award:	Level 5 - 33% Level 6 – 67%
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For full details of assessment regulations for all taught programmes please refer to our [Results webpages](#). These include the criteria for degree classification.

Admissions Requirements

Please see the [Application webpages](#) for more information on how to apply, including a statement on how we support students from a variety of backgrounds. Please also see our [general entry requirements](#) for taught programmes. Applicants who do not meet our published entry requirements are encouraged to contact our admissions team for further advice and guidance.

Typical applicant profile and any programme-specific entry requirements

Applicants will normally have some interest, experience or employment ambitions related to areas such as computing, IT and data analysis. The programme is not just aimed at recent leavers of School/College but is also an option for mature candidates who may have aspirations to return to education, perhaps as a springboard towards a significant career change. Standard University entry requirements will apply.

Do applicants required a Disclosure and Barring Service (DBS) Check?	No
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Opportunities for students on successful completion of the programme

Within the course, students will cover specific modules dedicated to the various facets of data science as part of a broader computing education. This means that graduates could go into a diversity of roles in computing and IT, as well as very particular roles as indicated by the fundamental course theme of data science – for example, data scientist, data analyst, business analyst. Progression to further study on a Masters programme is a meaningful alternative to employment as a next step after completing this BSc course.

Recognition of Prior Learning

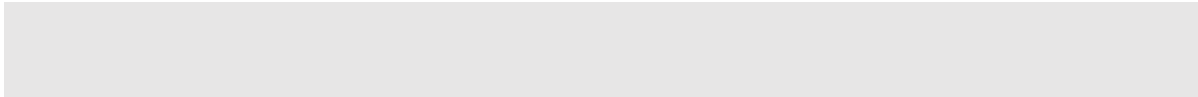
Previous study, professional and / or vocational experiences may be recognised as the equivalent learning experience and permit exemption from studying certain modules. Please refer to our [Credit Accumulation webpages](#) for further guidance.

Student Support

During the course of their studies, students will be supported in the following ways:

- At the start of their studies all students will receive a full **induction** to the programme which will include introduction to the staff responsible for delivering the course, and access to library and IT facilities
- The **Programme Handbook** will outline the exact nature of the course and how it is structured, including the availability of option modules
- Each student will be allocated a **Personal Tutor** who will support their academic development, be able to advise and guide them with their studies and, where necessary, give advice on study options
- Students will be able to access our full range of **support services**, including the Learning Development Unit for skills and study support, the Library, the Careers and Employability Team, Student Finance Team, Accommodation and Counselling Services

Programme specific support (if applicable)



Appendices

Quality Assurance

Awarding Body:	Buckinghamshire New University
Language of Study:	English
QAA Subject Benchmark Statement(s):	Computing (2016) https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-computing-16.pdf?sfvrsn=26e1f781_12
Assessment Regulations:	<i>Academic Assessment Regulations</i> , accessible via the Academic Advice webpages (https://bucks.ac.uk/students/academicadvice)
Does the Fitness to Practise procedure apply to this programme?	No
Ethics Sub-committee	Computing Ethics Sub-Committee
Date Published / Updated:	September 2019
Date programme re-approval required:	September 2025

Other awards available on programme (Exit Qualifications)

Please refer to the *Academic Qualifications Framework* for Exit Qualifications recognised by the University and credit and module requirements.

Name of Exit Qualification:	Certificate of Higher Education (CertHE)
Full name of Qualification and Award Title:	CertHE in Data Science
Credits requirements:	120 Credits
Module requirements:	ALL 120 Credits at Level 4
Learning Outcomes	
Understand the operation of the major hardware units of computers and appreciate the fundamental components and protocols of network systems	
Comprehend the requirements for a relatively simple problem, before devising and implementing an appropriate solution	
Show competence in the design and development of Web and database artefacts, paying appropriate attention to the context and to user expectations	
Exhibit an understanding of digital technologies within a professional context, and how different tools and environments can be used for handling information, communication and other purposes	
Demonstrate a range of transferable skills, including team work and meeting deadlines	

Name of Exit Qualification:	Diploma of Higher Education (DipHE)
Full name of Qualification and Award Title:	DipHE in Data Science
Credits requirements:	240 Credits
Module requirements:	ALL 120 Credits at Level 4 PLUS ALL 120 Credits at Level 5
Learning Outcomes	
Apply appropriate tools and modelling techniques in the critical analysis and design of information systems with respect to data structures and databases	
Acquire background knowledge and associated skills necessary to develop secure business applications deployed on Web-based platforms	
Implement the key activities prevalent in the software lifecycle, respecting dependencies between stages and context requirements, to plan and deliver technical solutions to complex problems	

Name of Exit Qualification:	Ordinary Degree
Full name of Qualification and Award Title:	BSc Data Science
Credits requirements:	300 Credits
Module requirements:	ALL 120 Credits at Level 4 ALL 120 Credits at Level 5 PLUS 60 credits from the following Level 6 modules: <ul style="list-style-type: none"> • CO617, CO656, CO652, CO654, CO618, CO657, CO653, CO655
Learning Outcomes	
Interrogate the complex dimensions of a technical problem in order to design and model an appropriate solution for the context	
Select and systematically utilise suitable skills, methods, techniques and strategies to develop, test and evaluate the solutions to different given problems	
Conduct themselves in a professional and confident manner when interacting with others, communicating their significant knowledge and understanding of their discipline in a range of formats, and contributing to the successful completion of a range of challenging tasks and multifaceted projects	