# Course Specification

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| **Published Date:** | 21-Mar-2023 |
| **Produced By:** | Multi Type Usr Record For All Personnel |
| **Status:** | Validated |

# Core Information

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| **Awarding Body / Institution:** | University of Wolverhampton |
| **School / Institute:** | School of Mathematics and Computer Science |
| **Course Code(s):** | CS016H01UV Full-time 3 Years<br>CS016H31UV Part-time 6 Years |
| **UCAS Code:** | |
| **Course Title:** | BSc (Hons) Data Science |
| **Hierarchy of Awards:** | Bachelor of Science with Honours Data Science<br>Bachelor of Science Data Science<br>Diploma of Higher Education Data Science<br>Certificate of Higher Education Applied Computing<br>University Statement of Credit University Statement of Credit |
| **Language of Study:** | English |
| **Date of DAG approval:** | 26/May/2017 |
| **Last Review:** | 2015/6 |
| **Course Specification valid from:** | 2015/6 |
| **Course Specification valid to:** | 2021/2 |

# Academic Staff

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| **Course Leader:** | Dr Paul Wilson |
| **Head of Department:** | Dr Kevan Buckley |

# Course Information

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| **Location of Delivery:** | University of Wolverhampton |
| **Category of Partnership:** | Not delivered in partnership |
| **Teaching Institution:** | University of Wolverhampton |
| **Open / Closed Course:** | This course is open to all suitably qualified candidates. |

## Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS

2017 Entry

- A Level minimum of BB or CDD.
- BTEC National Diploma grade MMP, BTEC National Certificate grade DM
- BTEC QCF Extended Diploma grade MMP, BTEC QCF Diploma grade DM
- Access to HE Diploma full award (Pass of 60 credits - of which a minimum of 45 credits must be at level 3 including 18 at Merit or Distinction).
- Applicants will normally be expected to hold GCSE English and Maths at grade C+/4 or equivalent
- If you've got other qualifications or relevant experience, please contact The Gateway for further advice before applying.
- International entry requirements and application guidance can be found here
- Successful completion of the International Foundation Year in Science and Engineering guarantees entry on to this course

## Distinctive Features of the Course:

IBM estimates that 90% of all data in the world today has been created in the past two years. As data becomes the new raw material of business the role of data scientist is becoming increasingly important. Whether it is predicting consumer behaviour, extracting information from medical images, uncovering hidden stock market indicators or studying human genetic structure, data science is inspiring change around the world.

BSc (Hons) Data Science course will develop in you strong mathematical, statistical, computational and programming skills. It focuses on the creation and application of powerful new methods for collecting, organising, analysing and making discoveries from large-scale data. In addition to this core knowledge you will develop expertise in specialist areas including machine learning, data mining and artificial intelligence. You will also be able to concentrate on project based learning and problem solving in one or more of the following areas: finance, mathematics and computer science. The course follows three years of study, with an optional year in industry after your second year.

## Educational Aims of the Course:

This course aims to develop your ability to analyse big data and use this analysis to make data informed decisions in a systematic way.

The course will teach you advanced problem-solving skills, the computing, mathematics and statistical skills you need to undertake appropriate analysis. These are skills which are highly sought after by many graduate employers. Data analysts are warmly welcomed in industry, business and commerce for their analytical ability and logical approach to unravelling complex issues.

## Intakes:

September
January

## Major Source of Funding:

Office for Students (OFS)

## Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.

| Year | Status | Mode | Amount |
|------|--------|------|--------|
| 2020/1 | H | Full Time / Sandwich | £9250.00 |
| 2020/1 | Overseas | Full Time / Sandwich | £12250.00 |
| 2020/1 | H | Part Time | £3050.00 |
| 2020/1 | Overseas | Part Time | £6125.00 |
| 2021/2 | H | Full Time / Sandwich | £9250.00 |
| 2021/2 | Overseas | Full Time / Sandwich | £12950.00 |
| 2021/2 | H | Part Time | £3100.00 |
| 2022/3 | H | Full Time / Sandwich | £9250.00 |
| 2022/3 | Overseas | Full Time / Sandwich | £13450.00 |
| 2022/3 | H | Part Time | £3120.00 |

## PSRB:

None

## Course Structure:

Continuing students will follow the programme indicated below:

# January (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 5CI021 | Data Mining | 20 | SEM1 | Core |
| 5CI022 | Databases | 20 | SEM1 | Core |
| 5MM025 | Statistical Modelling & Survey Design | 20 | SEM1 | Core |

Continuing students will follow the programme indicated below:

# January (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 6CS007 | Project and Professionalism | 40 | CRYRA | Core |
| 6CS012 | Artificial Intelligence and Machine Learning | 20 | SEM2 | Core |
| 6CS030 | Big Data | 20 | SEM2 | Core |

Continuing students will follow the programme indicated below:

# January (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 6MM029 | Multivariate Statistics with Cybermetrics | 20 | SEM1 | Core |
| 6CS005 | High Performance Computing | 20 | SEM1 | Core |

# September (Full-time)

Full time and Sandwich Undergraduate Honours students normally study 120 credits per academic year; 60 credits semester 1 and 60 credits semester 2.

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 4CS001 | Introductory Programming And Problem Solving | 20 | SEM1 | Core |
| 4CS015 | Fundamentals of Computing | 20 | SEM1 | Core |
| 4CS017 | Internet Software Architecture | 20 | SEM1 | Core |
| 4MM013 | Computational Mathematics | 20 | SEM2 | Core |
| 4MM025 | Probability & Statistics | 20 | SEM2 | Core |
| 4CS020 | Introduction to Games Technology for Serious Applications | 20 | SEM2 | Core |

# September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 5CI021 | Data Mining | 20 | SEM1 | Core |
| 5CI022 | Databases | 20 | SEM1 | Core |
| 5MM025 | Statistical Modelling & Survey Design | 20 | SEM1 | Core |
| 5CS024 | Collaborative Development | 20 | SEM2 | Core |
| 5MM014 | Introduction to Operational Research | 20 | SEM2 | Core |
| 5CI023 | Advanced Databases | 20 | SEM2 | Core |

## September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

| Module | Title | Credits | Period | Type |
|--------|-------|---------|--------|------|
| 6CS007 | Project and Professionalism | 40 | YEAR | Core |
| 6MM029 | Multivariate Statistics with Cybermetrics | 20 | SEM1 | Core |
| 6CS005 | High Performance Computing | 20 | SEM1 | Core |
| 6CS012 | Artificial Intelligence and Machine Learning | 20 | SEM2 | Core |
| 6CS030 | Big Data | 20 | SEM2 | Core |

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, to create the best learning experience.

## Learning, Teaching and Assessment

### Academic Regulations Exemption:

### Reference Points:

Quality Code - [Part A: Setting and Maintaining Academic Standards](). Including :

[Qualifications Frameworks]()

[Characteristics Statements]()

[Credit Frameworks]()

[Subject Benchmark Statements]() - *Computing*

Quality Code - [Part B: Assuring and Enhancing Academic Quality]()

[University Policies and Regulations]()

Equality Act (2010).

### Overview of Assessment:

As part of the course approval process, the course learning outcomes were mapped to each of the modules forming the diet of the programme of study. This process confirmed that all course learning outcomes can be met through successful completion of the modules. This mapping applies to the final award as well as to all of the intermediate awards.

| Learning Outcomes | Modules |
|---|---|
| **CERTHE01** Demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study, and an ability to evaluate and interpret these within the context of that area of study. | |
| **CERTHE02** Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study. | |
| **CERTHE03** Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work. | |
| **CERTHE04** Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments. | |
| **CERTHE05** Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility. | |
| **DIPHE01** Demonstrate knowledge and critical understanding of the well-established principles of your area(s) of study, and of the way in which those principles have developed with an understanding of the limits of your knowledge, and how this influences analyses and interpretations based on that knowledge. | |
| **DIPHE02** Demonstrate the ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context. | |
| **DIPHE03** Demonstrate knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study. | |
| **DIPHE04** Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis. | |
| **DIPHE05** Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively. | |
| **DIPHE06** Demonstrate the qualities and transferable skills necessary for employment, requiring the exercise of personal responsibility and decision-making and undertake further training, developing existing skills and acquire new competences that will enable them to assume significant responsibility within organisations. | |
| **BHONSN01** Demonstrate and apply an understanding, knowledge and experience of the principles of Data Science. | |
| **BHONSN02** Develop and apply knowledge and experience of a range of various technologies, techniques, tools and methods used to analyse data. | |

| Learning Outcomes | Modules |
| --- | --- |
| BHONSN03 Demonstrate a knowledge of Big Data Analytics for analysing and mining data and developing decision models in a broad range of application areas. | |
| BHONSN04 Develop and demonstrate a range of transferrable skills in problem solving, communication, project management, working individually and in teams, self-management and the ability to gather, evaluate and reflect on information to support the decision making process. | |
| BHONSN05 Demonstrate a knowledge of a range of social, legal, ethical and professional skills and apply this knowledge in advanced studies or professional practice. | |
| BHONS01 Demonstrate and apply a full understanding, knowledge and experience of the principles of Data Science. | |
| BHONS02 Develop and apply knowledge and experience of a range of various technologies, techniques, tools and methods used to analyse data. | |
| BHONS03 Demonstrate a thorough knowledge of Big Data Analytics for analysing and mining data and developing decision models in a broad range of application areas. | |
| BHONS04 Develop and demonstrate a range of transferrable skills in problem solving, communication, project management, working individually and in teams, self-management and the ability to gather, evaluate and reflect on information to support the decision making process. | |
| BHONS05 Demonstrate a comprehensive knowledge of a range of social, legal, ethical and professional skills and apply this knowledge in advanced studies or professional practice. | |

## Teaching, Learning and Assessment:

The learning activities on your course will develop distinctive graduate attributes that will make you stand out and enhance your employability.

These skills will be embedded into the curriculum throughout your course. Examples include:

Digitally Literacy: All Mathematics graduates will surely be users of advanced technologies. However, on your course you will develop your skills to encompass literacy more fully such as learning how to find information and how to take best advantage of digital resources and the Internet to make you effective in the Information Age.

Global Citizenship: On each level of your course you will learn about the social aspects of Mathematics, which will broaden your understanding of the way the world works and how communication and collaboration are evolving.

Knowledgeable and Enterprising: Throughout your course you will build up your professional and employability skills and learn to apply the knowledge you have acquired in an enterprising way. You will constantly nurture your own intellectual curiosity. The tools, methodologies and techniques that you will learn have been carefully selected to prepare you with the skills that employers demand and the opportunities for work based learning and placements will allow you to gain the vital experience that they often expect

Formative assessments provide feedback and are not used in the grading process. Their purpose is to provide both tutors and students with a gauge of progress. Summative assessments are used in the grading process. Most summative assessments (with a notable exception of exams) also have a formative aspect to them in that tutors provide written feedback on the work. Students should use this feedback to improve their performance on future assessments. Feedback on an assessment on one module may help with assessments on other modules. Assessment methods are closely linked to the learning and teaching approaches used.

Below are examples of the assessment methods that you may encounter.

Assignments – task based and report based assignments. Coursework frequently requires the writing of reports documenting the development of solutions. It is frequent practice to ask students to reflect on their learning experience as part of the coursework.

Case studies – based on realistic scenarios. Analysis, application and evaluation skills are developed via case studies as appropriate for the topic areas.

Practical exercises – tutorials and workshop sessions. These aid understanding and application of knowledge using a variety of IT tools within practical settings in workshops as well as assessing depth and breadth of understanding and application of subject knowledge. Practical exercises are the primary mechanisms for assessing analysis and evaluation. The tasks undertaken involve well-defined problems with varied level of complexity. Some practical exercise may involve interactive learning tools that are able to provide formative feedback.

Portfolios / e-portfolios – contain samples of work demonstrating what the student has accomplished. This is a good way to assess learning and development which is illustrated by multiple examples of work, opportunities for self-assessment and reflection chartering over a period of time. Tasks set relate to outcomes being assessed thus documenting evidence of development towards mastering the identified outcomes and skills. Enhances the assessment process by demonstrating a range of skills and understandings of the subject area by the student. Some portfolios are sometimes called Learning Journals.

Formal presentations - you may be required to present your work to a group of tutors or to the rest of the class. This may be a demonstration of practical work or something you developed or built or may present the results of a study. These are an important way of assessing your communication skills.

Examinations and Time-Constrained Assessments (tests) - may follow a traditional format or on-line alternatives. They are used to ensure breadth of knowledge has been acquired. TCA and examinations, some of which are case study based, emphasise application of knowledge and skills.

Group Project Work - where group work is assessed, mechanisms are used to allow individual contributions to be reflected in the grading as appropriate e.g. peer assessment of individual group members, individual reflection on the process and the product.

Peer-group assessment – using student feedback, particularly in group assessments to identify each student's contribution to the work.

Individual Project Work - All courses require at least one module of individual project work where students work individually on a large task. This type of work is supported by either regular meetings with a named project supervisor or through seminars.

Work-based assessments – used to assess the student's work-based modules and enable feedback from work placement organisations. These are usually used for students who are industry-based and doing their course part-time or students doing a placement.

Assessments will also focus on skills such as team working, time-management and developing Continuing Professional Development (CPD) awareness, as well as discipline-specific skills related to the analysis, design, development, implementation, testing and evaluation of systems. Typical tasks include: production of technical documentation, reports for differing target audiences, presentations, demonstrations and viva, allowing assessment of the breadth and depth of knowledge, analysis and synthesis, communication, and evaluation within the subject area.

## Assessment Methods:

At the University of Wolverhampton, a variety of modes of assessment will be used to support and test your learning and progress and to help you develop capabilities that are valued beyond your University studies and into your working life. Your course may include a variety of assessment activities:

Written examinations (including online examinations, open and closed book examinations and quizzes)

Coursework (for example, essays, reports, portfolios, project proposals and briefs, CVs, poster presentation) Practical (for example, oral and video presentations, laboratory work, performances, practical skills assessment)

In the final year of your undergraduate degree, and at the end of your postgraduate degree, you are likely to be expected to write an extended piece of work or research, such as a dissertation or a practice-based piece of research.

## Student Support:

University provided support:

As well as providing general counselling support the University Counselling Service provides short courses on topics such as "Self Confidence", "Stress Management and Relaxation" and "Life Skills". They also provide study skills and academic support, providing short courses such as provide help in areas such as "Writing and Assignment Skills", "Exam Techniques", "Enhancing Professional Skills", "Personal Development Planning" and "Making Choices for the Future.

University Learning Centres provide general academic skills support to all students. You can make an appointment with a study skills advisor for advice on areas such as academic writing, assignment planning, exam preparation, and time management. In addition, there is a regular timetable of drop-in and bookable workshops covering information and digital literacy skills, including academic referencing. School of Computing and IT students are supported by a designated subject librarian who is available to support research and project work.

Course support:

At the start of each year of your course you will be assigned a Personal Tutor who will guide you through the induction process and provide support and academic counselling throughout the year on an appointment basis. They should be able to offer you advice and guidance to help you liaise with other staff and support facilities in the School and University. You should meet your Personal Tutor at least 3 times a year, which must include meetings that you are invited to at critical points in your course.

The Personal Tutor provides academic counselling and will be accessible throughout the week on a drop-in or appointment basis to discuss timetables, requests for extensions, requests for extenuating circumstances, general concerns about study and student life and general programme planning. The Personal Tutor will act as a first point of contact in relation to leave of absence (including returning after leave), withdrawal, transferring to another course (internal and external) and changes to mode of attendance. Your Course Leader will be available thereafter for meetings by appointment to discuss leave of absence, withdrawal, transferring to another course (internal and external), changes to mode of attendance, returning after leave of absence and direct entrants.

Subject support:

Tutorials, workshops, seminars and meetings - provide the primary opportunities for students to interact with staff on topics relating to modules. All modules provide at least one of these forms of face-to-face support.

Formative feedback - tutors provide personalised written feedback on most summative assessments. The mechanism for feedback from purely formative tasks varies between assessments, but will always be provided in some form. Online formative tasks often provide feedback straight away. On occasions tutors may provide generalised verbal feedback to the whole class on points relating to an assessment

Assessment and subject-based surgeries provide additional student support for subjects that students often need extra help with. They are often concentrated around the times when assessments take place. Revision sessions are provided for many modules that have exam-like tests and enable you to interact with tutors to review parts of the course. Mock exams and tests may provide opportunities to experience an examination environment before the final summative test and give you feedback on your understanding.

## Employability in the Curriculum:

Throughout your course you will build up your professional and employability skills and learn to apply the knowledge you have acquired in an enterprising way. You will constantly nurture your own intellectual curiosity. The tools, methodologies and techniques that you will learn have been carefully selected to prepare you with the skills that employers demand and the opportunities for work based learning and placements will allow you to gain the vital experience that they often expect.

THE UNIVERSITY OF OPPORTUNITY