Programme Specification: Data Science and Analytics BSc

UNIVERSITY OF WESTMINSTER

Course record information

Name and level of final award	• Bachelor of Science with Honours - Data Science and Analytics • Bachelor of Science with Honours - BSc Data Science and Analytics with industrial experience • Bachelor of Science with Honours - Data Science and Analytics with International Experience The award is Bologna FQ-EHEA first cycle degree or diploma compatible
Name and level of intermediate awards	• Bachelor of Science (BSc) - Data Science and Analytics • Diploma of Higher Education (Dip HE) - Data Science and Analytics • Certificate of Higher Education (CertHE) - Data Science and Analytics
Awarding body/institution	University of Westminster
Teaching institution	University of Westminster
Status of awarding body/institution	Recognised Body
Location of delivery	Primary: Central London
Language of delivery and assessment	English
QAA subject benchmarking group(s)	• Computing : https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-computing.pdf?sfvrsn=ef2c881_10 • Mathematics, Statistics and Operational Research: https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/subject-benchmark-statement-mathematics-statistics-and-operational-research.pdf?sfvrsn=e8f3c881_4
Professional statutory or regulatory body	British Computer Society (BCS)
Westminster course title, mode of attendance and standard length	• BSc Data Science and Analytics FT, Full-time, September start - 3 years standard length with an optional year abroad or placement
Valid for cohorts	From 2025/6

Admissions requirements

There are standard minimum entry requirements for all undergraduate courses. Students are advised to check the standard requirements for the most up-to-date information. For most courses a decision will be made on the basis of your application form alone. However, for some courses the selection process may include an interview to demonstrate your strengths in addition to any formal entry requirements. More information can be found here: https://www.westminster.ac.uk/study/undergraduate/how-to-apply

Recognition of Prior Learning

Applicants with prior certificated or experiential learning at the same level of the qualification for which they wish to apply are advised to visit the following page for further information:

https://www.westminster.ac.uk/current-students/guides-and-policies/student-matters/recognition-of-prior-learning

Aims of the programme

The BSc Data Science and Analytics course has been designed to:

- Provide students with knowledge of the fundamental principles and technologies that underpin the disciplines of mathematics, statistics and computing with an emphasis on the skills and theories required in data science and analytics.
- Initiate students into the selection and application of cutting-edge mathematics, statistics and computer science techniques and tools to collect, store, prepare, analyse and visualise data.
- Comprehend and manage data science and analytics project lifecycle.
- Provide a motivating and inclusive environment with the opportunity to develop themselves intellectually and socially and to encourage students to develop as independent and self-critical problem solvers.
- Prepare students with professional attitudes with awareness of ethical, legal, and social issues, interpersonal and entrepreneurial skills required in industry.
- Prepare students for continued study at an advanced level in either formal postgraduate study or as continued professional development.

Overall this course aims to equip students with a combination of analytical, technical and presentation skills needed to convert data into valuable insights in an appropriate format to support decision making. These skills are much needed in a continuously changing global environment where huge and fast-growing amount of data are generated through the use of Social network and Internet of Things, processed and analysed through increasingly sophisticated computer capabilities and algorithmic models, and stored using sophisticated technologies such as Cloud Computing. These skills are needed by both businesses and governments. Businesses have been collecting data on their customers, partners and the market in which they operate to support evidence-based decision making. Similarly governments rely on data to improve their policies and deliver better services.

Employment and further study opportunities

University of Westminster graduates will be able to demonstrate the following five Graduate Attributes:

- Critical and creative thinkers
- Literate and effective communicator
- Entrepreneurial
- Global in outlook and engaged in communities
- Social, ethically and environmentally aware

University of Westminster courses capitalise on the benefits that London as a global city and as a major creative, intellectual and technology hub has to offer for the learning environment and experience of our students.

The course offers a short-term work-based learning experience by providing you with an opportunity to work on a real-life problem which is normally set by an external organisation as a small-scale project.

This project forms a part of the assessment in a designated module called 5DATA004W Data Science project Lifecycle. This module provides the structure for your learning and receiving support from the module team. You will work on the project on your own and/or as part of a small team within and outside the class. During this time, you may also get a

chance to interact with the organisation that has set the project. The quality of the work that you produce for the project get assessed as part of the module's assessment.

This experience will allow you to put theory into practice by applying your knowledge and skills gained from various modules to address a real-life situation, usually within the context of a business-related problem. Furthermore, this experience will help you develop subject-specific technical skills as well as certain employability skills such as leadership, organisation and commercial awareness.

In addition. this course gives you with the opportunity to take a year in industry (work placement) after completing the second year of your study and gain work experience, increasing your chances of employability after graduation. You will be offered help and support to find and secure placement opportunities through various workshops and events organised by the Career Development Centre and the course team. Typically, you will be assigned into roles involving tasks related to data science and analytics.

The *BSc Data Science and Analytics* aims to create graduates who have a strong focus on solving real-world problems, have adaptability and maturity, and have a strong foundation of knowledge and the technical capability to be able to immediately contribute to their workplace environment. Graduates of the *BSc Data Science and Analytics* course will have been taught and have utilised industrial techniques and tools and will be versed in analytical and technical aspects of data processing, analysis and visualisation. Graduates shall be independent thinkers, prepared for lifelong learning and be able to analyse, critically reflect, and confidently and effectively communicate. They shall be able to meet the required professional and ethical standards expected in the workplace. Graduates shall also be capable of and prepared for broadening their knowledge by undertaking Masters level study on related subjects. We provide such opportunity to our graduates within the School of Computer Science and Engineering.

Attributes are developed throughout all levels of the course to help graduates compete effectively in a global changing environment. The table below maps the attributes to the core course modules for levels 4 to 6.

In brief, our graduates will be distinctive in being:

- Critical and creative thinkers: investigating various datasets to identify research questions and formulate hypotheses, using appropriately analytics techniques to support problem solving, designing experiments to discover knowledge that contribute to decision making.
- Literate and effective communicator: communicating analysis ideas and results in written and verbal forms and through effective use of data visualisation methods and presentation tools.
- Entrepreneurial: Having fundamental knowledge of the organisation operations and issues, tackling problems resiliently and confidently both independently and in groups, reflecting and learning from own performance.
- Global in outlook and engaged in communities: engaging in Data Science and Analytics networking events, participating in competitions.
- Socially, ethically and environmentally aware: adhering to ethical code, making responsible use of data driven technologies, avoiding biased data collection and presentation.

Upon completion of the course students will be expected to seek a data scientist, data engineer or data analyst role in any type of organisation, whether it is in industry, research or government, to bring their analytical skills to the benefit of a variety of problems, e.g. healthcare, retail industry, etc. Data scientist roles were found to be the most difficult to fill due to difficulties finding potential candidates with the required levels of skills, knowledge and experience. This BSc course aims at filling the gap by integrating analytics and computer science and ensuring the right balance between them enabling graduates to use their technical skills to manage, analyse and visualise data. (See course outcome section)

What will you be expected to achieve?

Learning outcomes are statements on what successful students have achieved as the result of learning. These are threshold statements of achievement the learning outcomes broadly fall into four categories:

- The overall knowledge and understanding you will gain from your course (KU)
- Graduate attributes are characteristics that you will have developed during the duration of your course (GA)
- Professional and personal practice learning outcomes are specific skills that you will be expected to have gained on successful completion of the course (PPP)
- Key transferable skills that you will be expected to have gained on successful completion of the course. (KTS)

Level 4 course learning outcomes: upon completion of Level 4 you will be able to:

- L4.1 Demonstrate knowledge of the underlying concepts and principles associated with mathematical and statistical modelling and programming (KU)
- L4.2 Relate the understanding of basic algorithmic, statistical and mathematical techniques to the analysis of well-defined small scale problems and the design of their solutions (KU)
- L4.3 Demonstrate ability to prepare, analyse and visualise data using appropriate mathematical and statistical techniques and tools (PPP)
- L4.4 Describe, create and manipulate simple data collections to store organisational data and business rules, recognising limitations of their underlying representation (PPP)
- L4.5 Methodically capture user requirements and devise an appropriate basic information system specification that meets them (KTS)
- L4.6 Apply programming principles and constructs to implement solutions to small scale problems (PPP)
- L4.7 Show awareness of the ethical issues involved in data life cycle (KTS)
- L4.8 Communicate clearly and effectively using structured and coherent arguments, results of their work undertaken through a guided process of selection of sources, in written and/or oral form (KTS)
- L4.9 Work effectively as a team member to achieve objectives and explain behaviour constraints of a professional code of conduct in a dynamic, diverse and inclusive (EDI) digital ecosystem (KTS)

Level 5 course learning outcomes: upon completion of Level 5 you will be able to:

- L5.1 Demonstrate understanding of the lifecycle of medium scale data science and analytics project and apply project management concepts and techniques (KU)
- L5.2 Comprehend organisational problems, abstract the essentials of problems and formulate them analytically and in symbolic form, so as to facilitate their analysis and solution, and grasp how analytical processes may be applied to them (KTS)
- L5.3 Demonstrate knowledge of the main algorithmic and analytic methods, and ability to evaluate critically the appropriateness of different approaches to solving problems (KU)
- L5.4 Demonstrate competency in applying algorithmic, analytical and visualisation approaches and techniques to solve medium scale problems, and appraise the effect of assumptions on analytical modelling and output analysis (PPP)
- L5.5 Explore new or existing data to identify patterns and relationships through the application of appropriate algorithms and tools (PPP)
- L5.6 Use a range of established techniques to demonstrate how information is modelled, persistently stored, manipulated and retrieved, as data, to serve scalable solutions to medium-scale business problems (KTS)
- L5.7 Effectively communicate models and analysis with accuracy and clarity to support high quality decision making (KTS)
- L5.8 Demonstrate professional responsibility in the development of quality data science solutions in a global context while integrating equity, diversity, and inclusion (EDI) considerations to ensure universal accessibility and inclusivity for all business stakeholders (KTS)
- L5.9 Identify and critically explain project failure risks including security risks, and their implications for organisations and adopt a holistic and proportionate approach to their mitigation (KU SS)

Additional Year course learning outcomes: upon completion of Additional Year you will be able to:

- 1EY.1 Enable personal development by devising a programme of international study that complements the content of the home degree programme and/or develops other interests. (GA PPP KTS)
- lEY.2 Appreciate the challenges and opportunities of studying/ working in an international context. (GA PPP KTS)
- lEY.3 Demonstrate an understanding of, and respect for, the cultural norms and differences of the host country at a societal level as part of an inclusive, global outlook. (GA PPP KTS)
- lPY.1 Experience commercial application of engineering knowhow and identify the factors affecting products and services in IT industry. (KU GA PPP KTS)
- lPY.2 Demonstrate the acquisition of a range of professional, practical, and key-transferrable skills relevant to the fields of computing. (KU GA PPP KTS)
- lPY.3 Take personal responsibility for directing your own learning and future career making the best use of the

opportunities, experiences and people that were available to you during your placement year. (GA PPP KTS)

- IPY.4 Draw upon the diverse approaches, perspectives, knowledge and experience of a diverse workforce, treating all individuals with respect and recognising their contribution to the host organisation. (KU GA PPP KTS)

Level 6 course learning outcomes: upon completion of Level 6 you will be able to:

- L6.1 Demonstrate a systematic understanding of a range of advanced modelling and visualisation methods and techniques, their conditions and limitations, and of the need to validate and revise models (KU)
- L6.2 Demonstrate critical understanding and assessment of models to analyse a problem, to frame appropriate questions to achieve a solution, to develop a comprehensive solution or to design a range of scenarios resulting from modifications to it (KU)
- L6.3 Critically assess complex problems that entail risk and uncertainty, approach them analytically leading to the formulation of solutions, and evaluate the environmental and societal impact of their solutions (KU KTS)
- L6.4 Appropriately analyse large scale data systems to discover trends and hidden relationships and inform/automate decision making (PPP)
- L6.5 Apply appropriate specialist software and/or programming as an aid to an analytical study for critically evaluating and/or visualising the outcomes to support conclusions and/or recommendations, or for acquiring any further information (PPP)
- L6.6 Be effective in professional and interpersonal communication of information, problems, models and solutions to both specialist and non-specialist audiences (KTS)
- L6.7 Demonstrate complete handling of the full life-cycle of a data science and analytics project underpinned by an entrepreneurial approach and a focus on the needs of real clients and the wider society whilst ensuring Sustainability, Equity, Diversity and Inclusion (EDI) (KU KTS)
- L6.8 Apply appropriate research methodologies in carrying out independent research in data science and analytics and produce a report demonstrating evidence of critical thinking (KTS)

How will you learn?

Learning methods

The BSc Data Science and Analytics course uses a variety of teaching and assessment methods, to ensure that every student on the course is empowered to fulfil their full potential and achieve the best outcome they possibly can.

A principal aim of the course is to equip you for professional life, or higher study, relevant to your current programme of study. To this end the course is organised into a collection of learning opportunities (modules) at various levels which are directly related to the aims and learning outcomes of the course. These modules are the building blocks of your course. Each module consists of learning activities which are delivered over a number of weeks. These learning activities are designed to help you achieve the knowledge and skills related to your subject area of business information systems.

A fundamental principle underlying the learning process and teaching methods used on this course is “learning-through-practice”. That is, to learn and understand the business skills and techniques required, students need to acquire skills through doing. This approach applies to both practical skills, which you will learn through project and laboratory work as well as to analytical skills, which you will learn by applying taught principles to problem-solving tasks. Much of the learning is achieved through active participation in taught interactive practical sessions. At the end of these sessions feedback will be given. For example, practical sessions typically form formative assessment components where you will be given support to complete the tasks described. At the end of these formative sessions you will be given written, verbal, qualitative feedback or a mixture of these to help you understand how well you have performed the task and how to improve it. These formative sessions are used as part of a teaching delivery framework aimed at developing your confidence and abilities to undertake the final summative assessment components for a given module. In general lecturers will provide written and/or verbal feedback on students’ work throughout the course and feedback maybe given individually or to the class collectively.

In order to develop general and transferable skills you will undertake a number of different activities such as group work that will help develop team working, collaborative and interpersonal skills and time management, You will be required to present and defend your work which will allow you to critically reflect on your learning and also allow you to develop your ability to concisely and clearly present your work.

How is Equality, Diversity, and Inclusivity (EDI) addressed in your course

The principles of Equality, Diversity and Inclusivity lay at the heart of the BSc Data Science and Analytics course. The course design ensures that you will have a learning experience that is flexible, respects diversity, encourages active participation and considers students varying needs. For example, the course will encourage and enable you to tailor your learning according to your career ambitions, cultural identity and individual aspirations by allowing you to choose a final year project specialisation within the broad area of data science and analytics, express your own unique evidenced based views of various societal and ethical issues, develop your own practical solutions to a given problem set and select option modules that will enable you to specialise or gain greater confidence in various application areas of data science and analytics. Through this myriad of opportunities and choices the course will equip you with the technical and employability skills required to work in a changing and diverse world. Above all you should be reassured that the course team aims to eliminate all arbitrary barriers to your learning and to work with you to achieve your best outcome.

The learning methods employed by the BSc Data Science and Analytics course are underpinned by three key principles. These are:

- Provision of a learning environment, both physical and digital, that is equitable, diverse and inclusive and which allows you to learn flexibly with materials that will be available to you in a number of learning context and at any time such as mobile and home environments;
- Provision of a supportive and safe learning environment, based on mutual trust and respect, where students are empowered to act as partners in their transformative learning experiences;
- Provision of a forward-looking course curriculum that is work-place relevant, current and authentic.

Practically, you will see this working in the following ways, for example:

- Teaching materials are, where possible, designed to be inclusive for all.
- The active development of mutual trust and respect between students and between staff and students.
- The celebration and encouragement of diversity through the core delivery of the course and extra-curricular activities.
- Emphasis on skill-based learning using a learn-by-practise approach; use of current and industry standard tools chains and methodologies; industry supported projects such as the WBL project;
- The teaching of broader concerns, concepts and skills such as the environment and project management that values inclusivity and diversity.
- A curriculum that is current, global in outlook and targeted at application areas that address real-world challenges.

In your first year of study (Level 4) you will make the full transition into Higher Education. You will develop the key core skills for statistics, mathematics and programming. To help this transition your course has additional classes and support sessions at this level that you will need to fully engage with so you can prepare for the advanced study that follows.

Your second year of study (Level 5) will help you develop some autonomy. At this level, you will develop detailed knowledge in the core concepts and techniques needed to understand, clean, transform and visualise data. You will then have the opportunity to acquire theoretical and practical understanding of some advanced techniques in machine learning and analytics. You will also gain an understanding of data science project lifecycle and develop teamwork and interpersonal skills needed to work in a professional environment including project management. There is an opportunity to study more specialist areas such as object-oriented programming, IT Security and design and implementation of algorithms. Following that level, you may choose to have a year in industry (a placement year) to strengthen your understanding of industry needs through direct application of your evolving skills.

Your final year of study (Level 6) introduces big data technologies and operational research methods. You will have the opportunity to specialise in areas that are most suited to your career ambitions such as applied AI, operations management and digital marketing, social media and web analytics. You will have learnt to work autonomously with your lecturers increasingly being there to support you and challenge your thinking. This is the level that completes your preparation for going into industry and further study, with an ability to handle the complexity of large-scale systems and environments and with full control of your further development needs.

Teaching methods

We tailor our teaching methods to both the diversity of the subject matter as well as the diversity of our students' to ensure that we maximise the effectiveness of our teaching. We aim to make our students ready for employment by exposing them to tools and techniques relevant and practised by industry.
The range of teaching methods you will experience will include:

- Lectures, seminars, and workshop sessions

- Projects (small groups, large groups and individual)
- Laboratories and computer-aided engineering
- Formative assessment including online quizzes
- Problem sheets, investigations, and design problems
- Individual supervision
- Online learning material

Lectures are used to support your learning. Within the lecture sessions you will be introduced to fundamentals, concepts and development methodologies and strategies. Lectures also have the advantage of showing you how different topics and facts interrelate with each other. Within lectures there will be interactive and participatory work to help monitor and encourage active engagement.

Seminars are used to provide a firm grounding in the theory, methods and tools used for a given module. Within these seminars you will be encouraged to collaborate and/or work in groups. Typically, these seminars will be practical in nature and will help you develop skills and understanding of how to apply knowledge covered in lectures to solve real problems. During the seminars the tutors will monitor your progress and provide feedback and guidance on your work.

Practical workshops maybe led by or informed by industry experts (alongside academic staff), these maybe on-site or online. In these sessions you will work alone or in groups, undertaking industry focused work or will be guided on how to complete a given milestone for a more long-term element of work such as a group project.

To further support remote learning some modules will employ the use of online quizzes to test your understanding and provide automatic feedback. The key purpose of such online quizzes is to allow you to practise knowledge at home and to provide you with an understanding of how successful your learning has been. It also allows tutors to diagnostically verify your understanding and tailor teaching in order to address any gaps. Through this feedback you can identify where to focus your learning effort.

Throughout the course, authentic assessment is used to help you practise skills required by industry. This includes investigative research-based problems and more practical project led problems. Within the course you will be asked to produce solutions and artefacts based on the requirements of typical real-world scenarios and products.

The final year project module is designed to unify and integrate skills and knowledge gained in the taught learning modules. The final project module provides the opportunity to put into practise and extend what has been learnt to solve a broader more complex and significant engineering problem. To support you in successfully completing the project, you will be allocated a supervisor who is a member of academic staff.

To increase accessibility of the learning material and ensure that a diverse range of learners can participate on the course each module will provide the following online support: access to teaching materials, online reading lists, discussion boards, virtual study rooms for students to collaborate and where applicable, space for individual and group online meetings. Individual support for each module will be available from the modules teaching staff.

At key stages in your academic studies, the decisions you will need to make such as choice of option modules and choice of individual project will be guided when required by your personal tutor. Students will also be academically supported by module leaders and the course leader during their studies.

The teaching methods described above are more effective when coupled with independent study time where you take more control of your own learning. To help enable you to maximise the benefits of self-study we introduce, explain to you, and develop your understanding of concepts and skill sets required for continual professional development (CPD). This is achieved using group-based activities, a framework of taught content, extracurricular events and assessment styles that encourage the planning and reporting of material that is self-learned.

Assessment methods

Assessments and feedback are an integral part of the learning process and enable you to gauge your progress in relation to learning outcomes, reflect on what you have learnt, identify areas in which you are strong and areas in which you need to improve and help you make informed decisions on the pace and focus of your own independent learning.

The guiding principles of assessment design and its associated feedback within the BSc Data Science and Analytics course are Purpose, Progression and Personalisation.

Purpose:

- assessment is authentic, meaning that it provides the chance to apply knowledge and competencies required within industry to solve real-world problems;
- the assessment method(s) used are clearly relevant to the module's learning outcomes; consideration is given to the amount of effort and time required to complete the task(s) and to maintain a balanced assessment load.

Progression:

- the choice of assessment method(s) employed provides an opportunity for new learning and contributes to the learning process;
- assessments are clearly related to the overall pattern of the course, they are developmental and not unnecessarily repetitive;
- less familiar types of assessments are prepared for using formative work such as practise laboratories.

Personalisation:

- you are able to make the assessment you own through design and implementation choices;
- timely feedback is given for all assessments;
- guidance on how you can improve your performance in the future is given, either individually or as part of a group.

As well as ensuring that students have met the learning outcomes per module, assessment will, where possible and appropriate, be:

- **demonstrative** (helping students to learn – evaluation of current knowledge);
- **rigorou**s (for correct and efficient solutions);
- **challenging** (requiring deep understanding and analytical ability);
- **workplace relevant** (tasks directly relating to industry and skills valued by employers);

On the BSc Data Science and Analytics course all assessments and feedback mechanisms are designed to form part of the learning experience and will take a variety of forms. The complexity and style of assessment for example will range from small tasks that might be completed within a seminar session to more complex and larger tasks which might be completed over an entire semester within a group. Some assessments are designed to be completed individually whereas other assessments may require students to work as part of a team, emulating as closely as possible the environment students will face in a professional setting.

Each module has both formative and summative assessment types. Formative assessment does not contribute to your overall grades. Formative assessment helps you establish where you are in your learning journey, what you have learnt so far, and where you may have to improve. Formative assessment can be used diagnostically by tutors to enable them to dynamically target their teaching to address any gaps in knowledge. Formative assessment can take the form of a test, quiz, reflective session or group activity.

All summative assessments that contribute to final grades will be assessed against clear assessment criteria stated in module descriptors. These assessment criteria are directly linked to the modules learning outcomes, and they will be used to evaluate the submitted work and to produce written feedback. The BSc Data Science and Analytics course provides inclusive, engaging and authentic assessment and feedback strategies to help provide equal opportunities, cater for different learning styles and to best support the student to successfully complete the course.

Example of Summative assessments used in the course	
Practical Coursework / Practical based portfolio	You will be expected to complete lab tasks following lab guidelines, demonstrate competency in the safe, secure and ethical use of tools and either answer specific questions about the labs (Coursework) or analyse your results based on a given scenario (Portfolio). This type of assessment is used to assess the technical skills you acquired during the term and your ability to apply your knowledge gained in the correct context following the correct procedures and standards.

Group Presentation with/without Group Coursework	You will be working in a group, typically of 3 to 4 members, investigating a specific problem, implementing a product or researching a specific topic. You will be expected to give a presentation to demonstrate your group work. This is usually followed by a brief discussion and questions and answers with your peers and instructor. Generally, you will need to discuss in detail what the group has achieved, and how, and also how the work and the team member responsibilities were distributed. You will also in some cases be expected to write a technical design report. This type of authentic assessment is used to assess your ability to work in teams in a context that closely matches typical teamwork activities found in industry. This demonstrate that you are able to be productive and complete your given tasks in a timely manner. This assessment generally has both a group and an individual mark component.
ICT (exam conditions)	You will be expected to sit an in-class test under timed conditions. Typically, these in-class tests can be a closed-book or open-book where you will have access to certain materials. This assessment is used to assess understanding of fundamental concepts, ability to apply theory to a range of problems and to substantiate ownership of work. Tests help ensure you can demonstrate that you have developed a deep understanding of the subject which enables you to cope with complex problems that require deep insight in order to provide secure and optimal solutions. This time-constrained assessment is authentic in that it verifies that you will have sufficient depth and coverage of knowledge in order to successfully solve typical time-critical engineering problems. It also helps you prepare for other professional exams and training.
Lab test	You will be expected to complete a specific lab task in the lab. This will be in most cases a timed activity where you are given instructions and a set of tasks to complete. This type of assessment is used to assess and evaluate your technical skills and/or ownership of work submitted.
Coursework Case study	You will be required to work on a scenario that illustrates a specific problem. You will have to study this problem and assess it and take decisions or make recommendations. This will require research and analysis and potentially implementation in order for you to produce an assessment and recommendation. This type of assessment is used to assess your understanding of topics related to your module and how you can apply your knowledge to a given scenario. This type of assessment usually requires you to evaluate your given solution or method and justify your answers.
Research essay	You will be expected to conduct in-depth research on a specific topic. This involves examining various resources, concepts and ideas about the topic you are researching. This type of assessment is used to assess your ability to critically evaluate research material and concisely summarise, formulating your own recommendations and suggestions depending on the context.
Oral Assessment and/or Individual Presentation	You will be expected to present in a form of either a presentation or discussion on a given topic. This could also be a part of your dissertation where you will be expected to sit a viva voce assessment to defend your work. This type of assessment is used to assess the authenticity of your work and give you an opportunity to explain the reasoning of the choices, methods and principles used in your work. This assesses a wide range of practical, analytical, and interpretative skills that demonstrate your understanding of the topic and your refection.
Artefact	You will be expected to produce a product such as a robotic device, electronic circuit, code implementation or a document containing a set of recommendation and guidelines that demonstrate your ability to innovate to provide solutions to a given problem. This assessment is used to assess your ability to produce quality artefacts as this is an essential requirement in the workplace.

Report	You will be expected to produce a document that outlines activities you have undertaken. This can be for lab work that you have completed, a work experience and work placement that you undertook, your reflective comments about a specific topic or a description of the design processes used for a given artefact. This type of assessment is used to evaluate how you can convey technical matters about activities you have conducted in an academic, concise, and justified manner.
Dissertation	This will probably be the biggest document you will have to produce for your entire studies. You will be expected to produce an extended piece of written work, that contains substantial evidence of research, investigations, and possibly implementation, all related to a specific problem you have chosen. Dissertations are the result of your independent work, carried out under the guidance of a supervisor. This type of assessment is used to verify that you have developed a sound understanding of the course material and are able to utilise the skills and knowledge gained in order to produce an independent and substantial project that successfully meets the given requirements.

Graduate Attribute	**Evident in Course Outcomes**
Critical and creative thinker	IPY.1, IPY.3, L4.1, L4.2, L4.3, L4.4, L4.6, L5.3, L5.4, L5.5, L5.6, L5.9, L6.1, L6.2, L6.3, L6.4, L6.5
Literate and effective communicator	1EY.1, L4.8, L5.7, L6.6, L6.8
Entrepreneurial	IPY.1, IPY.2, IPY.3, L4.5, L4.9, L5.1, L5.2, L6.3, L6.7
Global in outlook and engaged in communities	1EY.1, IEY.2, IEY.3, IPY.4, L4.9, L5.8, L6.3, L6.7
Socially, ethically and environmentally aware	IEY.2, IEY.3, IPY.4, L4.7, L5.8, L6.7

Course Structure

This section shows the core and option modules available as part of the course and their credit value. Full-time Undergraduate students study 120 credits per year. Course structures can be subject to change each academic year following feedback from a variety of sources.

Modules are described as:

- **Core** modules are compulsory and must be undertaken by all students on the course.
- **Option** modules give you a choice of modules and are normally related to your subject area.
- **Electives**: are modules from across the either the whole University or your College. Such modules allow you to broaden your academic experience. For example, where electives are indicated you may choose to commence the study of a foreign language alongside your course modules (and take this through to the final year), thereby adding further value to your degree.
- Additional information may also be included above each level for example where you must choose one of two specific modules.

Modules

Level 4

Module Code	**Module Title**	**Status**	**UK credit**	**ECTS**
4ELEN010W	Applied Mathematics	Core	20	10
4BUIS003W	Business Requirements Analysis	Core	20	10
4BUIS015W	Database Technologies	Core	20	10
4COSC001W	Software Development I	Core	20	10
4COSC005W	Software Development II	Core	20	10

Module Code	Module Title	Status	UK credit	ECTS
4DATA001W	Statistical Modelling and Analysis	Core	20	10

Level 5

Module Code	Module Title	Status	UK credit	ECTS
5BUIS019W	Business Analytics	Core	20	10
5DATA005W	Data Engineering	Core	20	10
5DATA004W	Data Science Project Lifecycle	Core	20	10
5DATA006W	Data Visualisation and Communication	Core	20	10
5DATA002W	Machine Learning and Data Mining	Core	20	10
5COSC020W	Database Systems	Option	20	10
5BUIS020W	Information Technology Security	Option	20	10
5COSC019W	Object Oriented Programming	Option	20	10
		Elective	20	10

Additional Year

Students who undertake the 4 year course must pass module 5COSC028W to achieve the award "with Industrial Experience" or pass module 5COSC027W to achieve the award "with International Experience" .

Module Code	Module Title	Status	UK credit	ECTS
5COSC028W	Computer Science and Engineering Industrial Placement	Core	120	60
5COSC027W	Computer Science and Engineering International Year	Core	120	60

Level 6

Module Code	Module Title	Status	UK credit	ECTS
6DATA006W	Big Data Analytics	Core	20	10
6DATA007W	Data Science and Analytics Final Project	Core	40	20
6DATA005W	Operational Research and Optimisation	Core	20	10
6DATA008W	Analytics in Operations Management	Option	20	10
6COSC020W	Applied AI	Option	20	10
6BUIS017W	Customer Relationship and Change Management (CRM & CM) with Business Intelligence	Option	20	10
6MARK017W	Digital Marketing, Social Media and Web Analytics	Option	20	10
6BUIS018W	Information Driven Entrepreneurship and Enterprise	Option	20	10
		Elective	20	10

Please note: Not all option modules will necessarily be offered in any one year. In addition, timetabling and limited spaces may mean you cannot register for your first choice of option modules.

Professional body accreditation or other external references

The British Computer Society (BCS) professional accreditation ensures independent validation that the course meets high standards set by the profession. It also benchmarks the course against those of other institutions both nationally and internationally and supports the continued improvement of the course, highlighting areas of best practice across institutions. Being a student on an accredited course provides a pathway to professional registrations such as Chartered IT Professional (CITP), Chartered or Incorporated Engineer (CEng/IEng) and Registered IT Technician (RITTech).

BSc (Honours) Data Science and Analytics fulfils the educational requirements of BCS for the CITP and partial CEng initial accreditation.

Students can apply for the free Operations Research Society student membership. Benefits include allocation of a mentor, access to O.R. journals and publications and meeting employers at our annual Careers Open Day.

Course management

The BSc (Honours) Data Science and Analytics course is under the School of Computer Science and Engineering and the management structure supporting the course is as follows:

- the Course Leader is responsible for day to day running and overall management of the course and development of the curriculum;
- the Head of School holds academic responsibility for the course and other courses within the School;
- the Head of the College of Design, Creative and Digital Industries, holds overall responsibility for the course, and for the other courses run by the College.

Academic regulations

The current Handbook of Academic Regulations is available at westminster.ac.uk/academic-regulations.

Course specific regulations apply to some courses.

Academic Support

Upon arrival, an induction programme will introduce you to the staff responsible for the course, the campus on which you will be studying, the Library and IT facilities, additional support available and to your Campus Registry. You will be provided with the Course Handbook, which provides detailed information about the course. Each course has a course leader or Director of Studies. All students enrolled on a full-time course and part time students registered for more than 60 credits a year have a personal tutor, who provides advice and guidance on academic matters. The University uses a Virtual Learning Environment called Blackboard where students access their course materials, and can communicate and collaborate with staff and other students. Further information on Blackboard can be found at https://www.westminster.ac.uk/current-students/studies/your-student-journey/when-you-arrive/blackboard

The Academic Learning Development Centre supports students in developing the skills required for higher education. As well as online resources in Blackboard, students have the opportunity to attend Study Skills workshops and one to one appointments. Further information on the Academic Learning Development Centre can be found at westminster.ac.uk/academic-learning-development.

Learning support includes four libraries, each holding a collection of resources related to the subjects taught at that site. Students1 can search the entire library collection online through the Library Search service to find and reserve printed books, and access electronic resources (databases, e-journals, e-books). Students can choose to study in the libraries, which have areas for silent and group study, desktop computers, laptops for loan, photocopying and printing services. They can also choose from several computer rooms at each campus where desktop computers are available with the general and specialist software that supports the courses taught in their College. Students can also securely connect their own laptops and mobile devices to the University wireless network.

Support Services

The University of Westminster Student and Academic Services department provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues, careers, specialist advice for international students and the chaplaincy providing multi-faith guidance. Further information on the advice available to students can be found at https://www.westminster.ac.uk/student-advice

The University of Westminster Students' Union also provides a range of facilities to support students during their time at

the University. Further information on UWSU can be found at https://www.westminster.ac.uk/students-union

How do we ensure the quality of our courses and continuous improvement?

The course was initially approved by a University Validation Panel. University Panels normally include internal peers from the University, academic(s) from another university. a representative from industry and a Student Advisor.

The course is also monitored each year by the College to ensure it is running effectively and that issues which might affect the student experience have been appropriately addressed. Staff will consider evidence about the course, including the evidence of student surveys, student progression and achievement and reports from external examiners, in order to evaluate the effectiveness of the course and make changes where necessary.

A Course revalidation takes place periodically to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers. Students meet with revalidation panels to provide feedback on their experiences. Student feedback from previous years is also part of the evidence used to assess how the course has been running.

How do we act on student feedback?

Student feedback is important to the University and student views are taken seriously. Student feedback is gathered in a variety of ways.

- Through student engagement activities at Course/Module level, students have the opportunity to express their voice in the running of their course. Course representatives are elected to expressly represent the views of their peers. The University and the Students' Union work together to provide a full induction to the role of the course representatives.
- There are also School Representatives appointed jointly by the University and the Students' Union who meet with senior School staff to discuss wider issues affecting student experience across the School. Student representatives are also represented on key College and University committees.;
- All students are invited to complete a questionnaire before the end of each module. The feedback from this will inform the module leader on the effectiveness of the module and highlight areas that could be enhanced.
- Final year Undergraduate students will be asked to complete the National Student Survey which helps to inform the national university league tables.

This programme specification provides a concise summary of the main features of the course and the learning outcomes that a student might reasonably be expected to achieve and demonstrate, if they take full advantage of the learning opportunities that are provided. This specification is supplemented by the Course Handbook, Module proforma and Module Handbooks provided to students.

draft

Published date: 21 May 2025