OXFORD BROOKES UNIVERSITY

PROGRAMME SPECIFICATION

for the award of

MSc Data Analytics

Managed by the Faculty of Technology, Design and Environment

delivered by the School of Engineering, Computing and Mathematics

Date approved:	March 2021
Applies to students commencing study in:	Sep 2021

RECORD OF UPDATES

Date amended*	Nature of amendment**	Reason for amendment**
25 January 2018	**Changes to acceptable/compulsory modules**	**Major change**
December 2020	**Change of module codes (same modules but different codes)**	**Consolidation of module codes**

Updated May 2016

SECTION 1: GENERAL INFORMATION

Awarding body:	Oxford Brookes University
Teaching institution and location:	Oxford Brookes University, Wheatley campuses
Language of study:	English
Final award:	MSc
Programme title:	Data Analytics
Interim exit awards and award titles available:	PGCert in Data Analytics PGDip in Data Analytics
Brookes course code:	TE63/MSC-DAT
UCAS code:	
JACS code:	G310
HECoS code:	101030
Mode of delivery:	Full-time (face to face/on-campus) Part-time (face to face/on-campus)
Mode/s and duration of study:	Full-time: normally 1 year Part-time: normally 2 years, up to a maximum of 5 years.
QAA subject benchmark statement/s which apply to the programme:	Master's degree characteristics (2010) Mathematics, Statistics and Operational Research (2015) Master's degrees in computing (2011)
Professional accreditation attached to the programme:	Not applicable
University Regulations:	The programme conforms to the University Regulations for the year of entry as published/archived at: https://www.brookes.ac.uk/regulations/current/specific/b4/ and http://www.brookes.ac.uk/regulations/

SECTION 2: WHY STUDY THIS PROGRAMME?

With recent developments in digital technology, society has entered the era of 'Big Data'. In the UK, Big Data has been announced as one of the Government's eight great technologies with priorities for funding and research. In June 2013, the Government published their "information economy strategy" outlining the pivotal role Big Data will play in rebuilding and strengthening the economy.

However, the explosion and wealth of available data in a wide range of application domains gives rise to new challenges and opportunities in all areas. One major challenge is how to take advantage of the unprecedented scale of data in order to acquire further insights and knowledge for improving the quality of offered services.

This programme has been developed to run alongside the MSc in Data Analytics for Government, which was specified in conjunction with the Office for National Statistics. The MSc in Data Analytics is available to all students, and is not exclusive to any particular employment sector.

Distinctiveness of the Programme

The MSc in Data Analytics provides graduates with the skills, knowledge and understanding necessary to identify, analyse and make effective use of the data which is available to them. The course has a strong focus on teaching theoretical concepts and using them to equip the students with the professional and technical skills needed in the workplace.

Graduates will develop the ability to investigate problems related to modelling and data analysis. This programme is particularly planned to be attractive for working participants. Hence, the programme is designed to:

- Educate participants from a variety of academic backgrounds to work as mathematical modellers and data analysts;
- Provide training in the fundamental theory but specifically practice of statistical modelling with special reference to data analysis and visualisation;
- Give participants the option to only take one or two modules that are most appropriate to their needs;
- Provide the flexibility of completing the MSc within 5 years;
- Enable the graduates to develop a strong ability to work effectively as an integrated member of a collaborative team in the investigation of problems related to modelling and data analysis;
- Link well to the central philosophy of 'Big Data', that an increased ability to analyse information in real-time and in a cost-effective manner leads to new levels of understanding about our business efficiency, customers, patients and Return On Investment (ROI).

SECTION 3: PROGRAMME LEARNING OUTCOMES

On successful completion of the programme, graduates will demonstrate the following Brookes Attributes:

3.1 ACADEMIC LITERACY

3.1.1 Select appropriate methods and models for data analysis.
3.1.2 Use a range of professional packages and advanced statistical techniques to apply advanced analysis, visualisation and critical interpretation of data.
3.1.3 Interpret correctly and evaluate critically the results of a modelling process.

3.2 RESEARCH LITERACY

3.2.1 Select and apply appropriate modelling and advanced analysis techniques in research and critically evaluate their use in providing an evidence based platform for decision making in practice.

3.3 CRITICAL SELF-AWARENESS AND PERSONAL LITERACY

3.3.1 Demonstrate appropriate knowledge of the role of statistics in different research areas, and select appropriate techniques for statistical modelling, and perform advanced analysis of the results using established methodologies of research and enquiry.
3.3.2 Demonstrate self-direction and originality in problem solving, self-management and independent learning ability.

3.4 DIGITAL AND INFORMATION LITERACY

3.4.1 Organise and analyse data, and to present it in a clear, logical and concise manner.
3.4.2 Perform complex computer based analyses of statistical data using visualisation and/or contemporary packages.

3.5 ACTIVE CITIZENSHIP

3.5.1 Communicate effectively with other analysts and modellers in the wider research community, including the presentation of the results of analyses, through written reports and oral presentations.
3.5.2 Critically evaluate the legal framework and international context in which data analysis techniques may be used, with an appreciation for the social and ethical issues which may arise.

SECTION 4: CURRICULUM CONTENT & STRUCTURE

4.1 PROGRAMME STRUCTURE AND REQUIREMENTS:

Code	Module Title	Credits	Level	Status	Coursework: Exam ratio
TECH7001	Research and Study Methods	10	7	Compulsory	100 : 0
DALT7002	Data Science Foundations	10	7	Compulsory	100 : 0
DALT7003	Survey Fundamentals	10	7	Compulsory	100 : 0
DALT7004	Statistical Programming	10	7	Compulsory	100 : 0
DALT7005	Introduction to Survey Research	10	7	Compulsory	100 : 0
DALT7006	Regression Modelling	10	7	Compulsory	100 : 0
DALT7009	Advanced Statistical Modelling	10	7	Compulsory	100 : 0
DALT7010	Time Series Analysis	10	7	Compulsory	100 : 0
DALT7011	An Introduction to Machine Learning	10	7	Compulsory	100 : 0
DALT7012	Advanced Machine Learning	10	7	Compulsory	100 : 0
DALT7013	Introduction to Distributed Systems	10	7	Compulsory	100 : 0
DALT7016	Data Visualisation	10	7	Compulsory	100 : 0
DALT7017	Dissertation in Data Analytics	60	7	Compulsory	100 : 0

Note that coursework assessment includes in-class tests.

4.2 PROGRESSION AND AWARD REQUIREMENTS

To obtain an MSc in Data Analytics students must pass all of the compulsory modules to give a total of 180 credits.

To obtain a PGDip in Data Analytics, students must pass DALT7002, DALT7003, DALT7004 and a further 90 credits from the modules listed.

To obtain a PGCert in Data Analytics, students must pass DALT7002, DALT7003, DALT7004 and a further 30 credits from the module listed.

4.3 PROFESSIONAL REQUIREMENTS

Updated May 2016

N/A

SECTION 5: TEACHING AND ASSESSMENT

5.1 Teaching, Learning and Assessment

The programme follows a supportive teaching and learning strategy based on active student engagement. The teaching, learning and assessment of the five classes of postgraduate attributes are addressed in a distributed way throughout the modules on the programme. The modules provide a scheme that ensures all the postgraduate attributes are met, as shown on the Map of Programme Learning Outcomes to Modules at the end of this document. Students experience a variety of teaching and assessment methods. Some modules feature critical appraisal reports, data analysis reports, data analysis using software applications, presentations and case studies. Learning methods include blended learning, formal lectures and problem solving practicals, but also guided independent learning, use of the computer based learning environment 'Moodle', independent research, software data analyses, experiments and the like.

By paying due regard to the Oxford Brookes University's Assessment Compact, the assessments on this programme have been designed to develop the learning of technical skills, shaped by the underlying theory and requirements of the industry. Assessment does not present students with a set of hurdles, but rather guides them through the staged acquisition, of a complex set of professional skills, so that, by the time they graduate, they are ready to play an effective role in their chosen career. Feedback on the assessment tasks will be provided in a timely manner, emphasizing the achievement of the learning outcomes of the modules and the programme. Students will be encouraged to relate the assessment tasks, with professional activities, and to relate their achievements with professional standards. Where appropriate, self and peer assessment will be used to encourage students to involve themselves in their own professional development. Details of the Assessment Compact are available at: http://www.brookes.ac.uk/aske/brookes--assessment-compact/

Weekly formative exercises will be set where appropriate, with fully worked solutions provided for a selection of problems. Other problems may be used for formative peer marking exercises designed not only to provide feedback to the students but also to communicate assessment criteria and expectations. This, when coupled with verbal feedback given by practical class tutors and seminar leaders, will give ample formative feedback to enable students to perform well in their assessed tasks.

Each specific postgraduate attribute is considered below and the way in which the programme enables students to meet the learning outcomes associated with each attribute is examined.

Academic Literacy

Academic Literacy will be assessed through coursework including in-class tests, to determine the students' ability to explain key concepts and to apply them to practical problem solving. Learning outcomes relating to data analysis are taught, learnt and assessed in all modules. A range of professional packages (including R and SAS) and advanced statistical techniques (including modelling) are taught in these modules. Learning methods include lectures, e-learning, demonstrations, tutorials and guided learning, and assessment features reports based on modelling and analysis of real life data.

Research Literacy

Most modules on the programme require students to research and critically evaluate the work of their own workplace or others within their assessed work. Research Literacy is primarily assessed in the dissertation module, but students will have learned and practised these skills in a number of modules, such as Machine Learning and Advanced Machine Learning.

Critical Self-Awareness and Personal Literacy

Many of the modules have tasks which involve the interpretation of modelling and analysis to solve complex problems. Self-awareness, and personal literacy, will be supported through the on-going use of reflection, which is assessed in coursework assignments, and culminates in the assessed reflective component of the dissertation. Several modules will include an element of team working, enabling

students to collaborate with their peers, thus developing an awareness of their own abilities, as reflected by feedback from others. Team work will also be used to assess the students' acquisition of personal and inter-personal skills, so important for this degree, and equally important for most careers.

Digital Information Literacy

Graduates of the programme will have very well developed computer based analytical skills because of the large amount of computer software used in the modelling and analysis of data. However, the postgraduate attribute 'Digital Information Literacy' extends beyond this to include the use of computers for more general skills such as presentations, literature reviews, preparation of design reports etc. All modules provide opportunities for students to learn and develop these abilities.

Active Citizenship

Graduates from this programme will develop a career in a world that is increasingly dependent on information technology and in which major social, political and economic endeavours are enabled by the technology. Students will develop an awareness of their active citizenship, through the core modules of the programme. The purpose of the programme is to support each student in their career undertaking data analysis and visualisation in their work, so it is essential for students to develop an understanding of the need for research investigating particular questions to take into account local conditions, and racial and cultural contexts. Teaching materials have therefore been developed with these issues in mind. This postgraduate attribute relates to how well the graduates of the programme are developing for work in the international and global context of their organisation.

5.2 Assessment Regulations

The programme conforms to the University Postgraduate Taught Regulations. Details can be found at: http://www.brookes.ac.uk/uniregulations/current

SECTION 6: ADMISSION TO THE PROGRAMME

6.1 ENTRY REQUIREMENTS

Students entering the course will normally hold one of the following qualifications:

- A good (first or second class) degree in the physical or social sciences which has developed analytical knowledge and understanding in mathematical sciences. Typically, this includes candidates with knowledge and familiarity with basic mathematics and statistics concepts and methods at a degree level.
- Applicants with other qualifications plus work experience from other fields who have quantitative skills and familiarity with data analysis and modelling ideas, to be reflected in their application, will also be considered. These applications must be approved by the Programme Lead.

The University strives to widen access to higher education for those traditionally under-represented among students.

Applicants with a proven track record in analysis and research are welcome to apply and start the course or can raise their entry status to an acceptable level for postgraduate study by taking appropriate undergraduate modules as associate students. The Programme Lead should be consulted for such applicants.

Where appropriate, suitable English as a Foreign Language qualifications (IELTS 6.0 or above) will be required.

Students with appropriate prior qualifications or experience may be entitled to claim credit for up to 12 modules on the course (120 credits). Students must take at least six modules (60 credits) at Oxford Brookes University in order to qualify for an award, and will receive a classification if they take 12 or more modules (120 credits) at Oxford Brookes University. Details of the University regulations for accreditation of prior learning can be found at http://www.brookes.ac.uk/regulations/current/core/a2/a2-5/

6.2 DBS AND OTHER PRE-COURSE CHECKS REQUIRED

Not applicable.

SECTION 7: PREPARATION FOR EMPLOYMENT

The role of data analytics has become increasingly important over the last decade. This is because data analysts hold the key to tackling the fundamental problem created by the revolution in the development of computers and automated systems in the 20th Century: how to make sense of the unprecedented volumes of data that are generated daily? Indeed, in every aspect of modern life, from online shopping and social networks to scientific research, health and finance, we collect immensely detailed information on actions taking place throughout the world. However, without proper analysis and appropriate interpretation, this data is just noise. Data analysts and modellers are concerned with turning this large-scale data into intelligence through the application of cutting-edge techniques in statistics and computer science. Currently, global demand for combined statistical and computing expertise outstrips supply, with evidence-based predictions suggesting a major shortage in this area for at least the next 10 years. For graduates in data analytics this shortage presents opportunities to enhance career progression in one of the most crucial areas of modern science.