UNIVERSITY of BRADFORD

Faculty of Engineering and Informatics

Department of Computer Science

MSc Big Data Science and Technology Programme Specification

Academic Year	**2020/21**
Degree Awarding Body	**University of Bradford**
Final and interim awards at Level 7 FHEQ (Framework for Higher Education Qualifications)	**Degree of Master of Science** **Postgraduate Diploma** **Postgraduate Certificate**
Programme accredited by	**BCS The Chartered Institute for IT**
Programme admissions	**September and January**
Programme duration	**12 months full time,** **24 months part time**
QAA Subject benchmark statement	**Computing (2016),** **Master's Degrees (2010)**
Date last confirmed by Faculty Board	**January 2021**

Please note: This programme specification has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant's offer will be communicated to them. Upon commencement of the programme, students will receive further detail about their course and any minor changes will be discussed and/or communicated at this point.

Introduction

MSc Big Data Science and Technology provides students with the knowledge of cutting-edge methodologies, approaches and skills in the emerging field of data science and big data applications, including advanced software development, systems for big data analytics, statistical data analysis data mining, distributed systems, data privacy and security, and data visualization and exploration. The programme of study culminates in a dissertation, enabling students to bring what they have learnt together in a significant piece of project work. In summary, the MSc Big Data Science and Technology offers students the opportunity to build their own path of study—from the advanced computing modules, the extended list of optional modules available, as well as the dissertation—so as to match their specific career aspirations in the area of big data and data science.

Today's information technology market is increasingly demanding employees with an advanced knowledge and skills on big data management, data analytics, machine learning and data mining. To fulfil the University's mission "Making knowledge work", this programme aims to enable students to develop important knowledge and understanding, practical discipline skills in the area of big data and data science. This programme will offer an opportunity for students to gain a range of transferable skills that will enhance their personal and professional development.

The MSc Big Data Science and Technology is located in the Faculty of Engineering and Informatics.

Programme Aims

The programme is intended to:

- Equip graduates with the cutting-edge knowledge and skills to work in the industry as a Data Scientist, Big Data Architect, or Big Data Analyst.
- Provide industry with graduates able to develop solutions to address challenges for big data analytics and developing big data systems.

Admission Requirements

We take into consideration a number of factors when assessing your application. It's not just about your grades; we take the time to understand your personal circumstances and make decisions based on your potential to thrive at university and beyond.

The standard entry requirements for the programme are typically an undergraduate degree classified at 2:2 or above in computer science, computer engineering, informatics or other computing adjacent subjects from an accredited degree awarding body.

As the programme will be taught in English all students need to have GCSE English grade 4 (old grade C) or above, or the equivalent national qualification. In addition, a test of written and spoken English normally needs to have been passed at grade 6.0 for IELTS or 550 for TOEFL (or 250 for the computer-based test) or above. Exceptionally, these requirements are waived if you have studied for and received an undergraduate degree from a UK institution within the last 2 years.

The University of Bradford has always welcomed applications from disabled students, and these will be considered on the same academic grounds as are applied to all applicants. If applicants have some form of disability, they may wish to contact the Disability Service before they apply at www.bradford.ac.uk/disability/before.

Please note: The information above relates to the contemporary recruitment cycle at time of publication and therefore may now be out of date. The current entry requirements are published online at www.brad.ac.uk/courses/pg/big-data-science-and-technology.

Recognition of Prior Learning

Applications are welcome from students with non-standard qualifications or mature students (those over 21 years of age on entry) with significant relevant experience.

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University has procedures to evaluate and recognise this learning in order to provide applicants with exemptions from specified modules or parts of the programme.

Intakes available

Students admitted to the programme in September study in the semester pattern of 1,2,3. Students admitted in January study in the semester pattern of 2,3,1. Part time routes are available for both admission periods. Students on part-time routes will study the taught component in year 1 and complete the dissertation in year 2.

Programme Learning Outcomes

To be eligible for the award of **Postgraduate Certificate** at FHEQ level 7, students will be able to:

1. Demonstrate a systematic understanding and critical awareness of discipline knowledge in big data analytics and big data system development.
2. Demonstrate an understanding of advanced techniques applicable to their research and development projects on big data applications.
3. Demonstrate originality in the application of principle and knowledge on big data analytics and big data systems, together with a practical understanding of applying big data analytics to generate new knowledge in the discipline.
4. Demonstrate ability of evaluating existing methodologies in the literature and proposing new methodologies for addressing challenges of big data.
5. Communicate the results and conclusion on big data clearly to specialist and non-specialist audiences.
6. Demonstrate the transferable skills for decision-making in complex and unpredictable situations in big data project.
7. Demonstrate the independent learning ability required for continuing professional development.
8. Demonstrate a systematic understanding and critical awareness of undertaking risk management with big data systems development.

Additionally, to be eligible for the award of **Postgraduate Diploma** at FHEQ level 7, students will be able to:

9. Deal with complexity in big data projects for design, development, and data analytics.

Additionally, to be eligible for the award of **Degree of Master** at FHEQ level 7, students will be able to:

10. Demonstrate skills to select, design, plan and manage a self-directed and managed research-informed original project, demonstrating a critical analysis and evaluation of relevant material and the ability to apply relevant skills and research methodologies in the production of an advanced report.

Learning and Teaching Strategy

This programme will involve a range of teaching and assessment approaches. The teaching, learning and assessment strategy takes into consideration the learning outcomes for the programme, the nature of topic studied and the need for students to demonstrate greater autonomy in their learning as they progress through the programme.

Students will experience a range of teaching and learning environments. Concepts, principles and theories are generally explored in formal lectures, demonstrated in laboratory classes, and practised in associated tutorials and seminars. Practical skills are developed in laboratories. Professional and personal skills are developed through

discussion, presentations and small-scale project work which involve problem solving and design exercises, often tackled by working in small groups. A particular strength of this programme is the contribution made to the teaching programme by successful research active members of staff. This new programme will also involve invited external speakers from various industry sectors. This will provide students with opportunities to learn from industry, such as the BBC, Microsoft and Sky and other SMEs. Students will also have opportunities to learn from each other in the specifically organized study clubs with fellow students.

Each 20-credit module on the programme requires 200 hours of study. Some of these hours will be formally timetabled lectures, laboratories, seminars, tutorials and workshops, while others will involve carrying out private study by students.

Formal lectures will facilitate the acquisition of knowledge and understanding, discipline specific skills (LOs 1-7), and make knowledge work (LOs 8-10). Laboratory sessions run in conjunction with the theoretical components will give students the opportunity to enhance their understanding of particular topics. These will also help to develop discipline specific skills and personal transferable skills. Tutorials, Seminar/workshops will develop knowledge and understanding, discipline specific skills and personal transferable skills. Directed study, involving directed reading of appropriate texts and the preparation of assessed work, is used to develop the majority of learning outcomes.

Assessment Strategy

The assessment strategy is designed to allow students to demonstrate achievement of the learning outcomes of an individual module appropriate to their level of study and the learning outcomes of the programme. These learning outcomes are consistent with the Framework for Higher Education Qualifications. Students will have the opportunity to demonstrate skills of analysis, synthesis and criticism through a wide variety of assessment strategies, including written and oral examinations, coursework assignments, report writing, group work, oral presentations, and a dissertation. The final project/dissertation provides a major opportunity for students to demonstrate their capability and skill in big data analytics and system development.

Curriculum

The programme has two stages: the taught programmes stage which takes place during the first two semesters (or four semesters for the part-time route), and the project/dissertation stage. The taught programmes stage is organised on a modular basis. All modules are assessed at FHEQ Level 7.

The programme has modules in the Autumn and Spring periods providing grounding and advanced study of the field. The final two semesters allow students the opportunity to develop, through sustained major project work, advanced knowledge and understanding of data science and Big Data management.

The curriculum may change, subject to the University's programme approval, monitoring and review procedures.

Programme Structure

Students study 60 core credits in the Autumn. Students study 40 core credits in the Spring and one 20 credit optional module from the list below. Work for the dissertation begins in the Spring and is submitted at either the beginning or the end of Semester 1 (Autumn).

Module Code	Module Title	Module Type	Credit	Semester
COS7009-B	Software Development	Core	20	Autumn (Sem1)
COS7006-B	Big Data Systems and Analytics	Core	20	Autumn (Sem1)
COS7046-B	Big Data Visualisation	Core	20	Autumn (Sem1)
COS7048-B	MSc Group Project	Core	20	Spring (Sem2)
COS7045-B	Advanced Machine Learning	Core	20	Spring (Sem2)
ENB7007-B	Risk Assessment and Management	Option	20	Spring (Sem2)
COS7043-B	Advanced IoT (Data science for IoT)	Option	20	Spring (Sem2)
COS7023-B	Internet Security and Protocol	Option	20	Spring (Sem2)
COS7004-E	Dissertation	Core	60	Spring & Summer (S2-3)

Students will be eligible to exit with the award of **Postgraduate Certificate** if they have successfully completed 60 credits and achieved the award learning outcomes.

Students will be eligible to exit with the award of **Postgraduate Diploma** if they have successfully completed at least 120 credits to include the 80 core credits at Level 7 and achieved the award learning outcomes.

Students will be eligible for the award of **Degree of Master** if they have successfully completed 180 credits and achieved the award learning outcomes.

Assessment Regulations

This Programme conforms to the standard University Postgraduate Assessment Regulations which are available at the following link: www.bradford.ac.uk/regulations

Minor Modification Schedule

Version Number	Brief Description of Modification	Date of Approval
7	Revised structure based on feedback from BCS visit and overall feedback from cohort	**March 2020**
8	Specification reformatted and made accessible. Text updated to accommodate January intake.	**January 2021**