Big Data Science and Analytics

Programme Information

2022.01, Approved

Overview

Programme Code	36209
Programme Title	Big Data Science and Analytics
Awarding Institution	Liverpool John Moores University
Programme Type	Masters

Awards

Award Type	Award Description	Award Learning Outcomes
Target Award	Master of Science - MS	N/A

Alternate Award Names	

Partner Name	Partnership Type
University of Bahrain	Franchised

External Benchmarks

Subject Benchmark Statement	

Programme Offering(s)

Mode of Study, Mode of Delivery	Intake Month	Teaching Institution	Programme Length Programme Length Unit
Part-Time, Face to Face	September	University of Bahrain	2 Years

Aims and Outcomes

Educational Aims of the Programme	The MSc in BDSA aims at providing society with highly qualified graduates that are able to cope with the data revolution. This is a rapidly growing field that needs practitioners who have the ability to use scientific principles and techniques to handle the complexity and diversity of large scale data streamed from different applications, so called big data, effectively and efficiently to extract valuable information. The MSc in BDSA has a unique interdisciplinary structure that relies on the integration between statistical and mathematical methods with the advances of computer science and information technology. The MSc in BDSA is designed to equip students with a comprehensive subject-knowledge that is complemented with practical sessions using advanced statistical tools, specialist software and computing technologies to address the spectrum of big data real-world applications. Moreover, the programme emphasizes on several skills that are highly valued by potential employers such as critical thinking, problem solving and communication skills. In addition, the programme provides students with the opportunity to submit a substantial work (thesis) to solve a real-world problem in the context of big data to demonstrate their ability in working independently and to appreciate the knowledge and skills gained during their study. -Work successfully as big data scientists or analysts in a variety of related career fields. -Pursue research activities in several related areas involving big data science and analytics. -Pursue professional development to be recognized as professional big data scientists or analysts. -Enhance society development through an effective use of the knowledge and skills specific to big data science and analytics. -Demonstrate broad and deep knowledge for the concepts, terminologies, techniques in the context of big data science and analytics. -Identify and formulate practical problems in a variety of big data applications. -Design and conduct effective data-driven experiments in a variety of professions to meet specific needs within the available resources and the existing constraints. -Use advanced statistical tools, specialist software and computing technology effectively for big data acquisition, quality evaluation, management and manipulation that involves storing, cleaning, exploring, visualizing, and analysing big data. -Provide a critical evaluation for the existing techniques in terms of applicability, effectiveness and efficiency and develop creative techniques to handle big data issues. -Extract valuable information from structured and unstructured big data and transform this information into actionable decisions. -Communicate important information in relation to big data appropriately to suit the target audience. -Demonstrate ability to work individually and collaboratively to handle complexity and diversity of big data problems. -Demonstrate awareness of ethics, responsibility and consequences in relation to collecting and using big data. -Conduct scientific research in relation to big data in order to handle challenged real situations. -Pursue life-long learning through continuous professional development in the field of big data science and analytics.

Learning Outcomes

Code	Number	Description
PLO1	1	Demonstrate a thorough knowledge of the statistical techniques used in big data science and analytics.
PLO2	2	Use computer skills to access research literature and communicate with peers.
PLO3	3	Collate, analyse and interpret large data sets.
PLO4	4	Critically evaluate complex issues in big data science and analytics.
PLO5	5	Demonstrate the dissemination of information and knowledge to diverse audiences.

PLO6	6	Prepare research proposals and business cases.
PLO7	7	Adapt knowledge and skills to unfamiliar problem domains.
PLO8	8	Communicate effectively, both written and verbally.
PLO9	9	Use IT to access, prepare, process and present and transmit information.
PLO10	10	Break down complex problems into a logically structured set of achievable tasks.
PLO11	11	Prioritise tasks, manage time effectively and work as part of a team.
PLO12	12	Demonstrate a clear understanding of the legal, ethical and protection issues in big data science and analytics.
PLO13	13	Demonstrate practical experience of the solution of problems in big data science and analytics using modern computational languages and techniques.
PLO14	14	Show originality in the application of knowledge, together with a practical understanding of the critical evaluation of research, scholarship and methodologies within big data science and analytics.
PLO15	15	Demonstrate the application of statistical and data visualisation techniques to familiar and unfamiliar problems in big data science and analytics
PLO16	16	Demonstrate the application of big data computing technologies and techniques.
PLO17	17	Critically evaluate information from a variety of sources, and draw and defend conclusions.
PLO18	18	Apply planning, research methodology and analytical skills to an in-depth study of a chosen research area.
PLO19	19	Analyse and solve set problems, choosing the appropriate techniques and technologies.

Course Structure

Programme Structure Description	To obtain a Master of Science degree in Big Data Science and Analytics, then students must acquire 180 credits at level 7.

Programme Structure - 180 credit points	
Level 7 - 180 credit points	
Level 7 Core - 180 credit points	CORE
[MODULE] 7501BDSA Research Methods Approved 2022.01 - 20 credit points	
[MODULE] 7502BDSA Statistical Data Analysis Approved 2022.01 - 20 credit points	
[MODULE] 7503BDSA Big Data Analytics Approved 2022.01 - 20 credit points	
[MODULE] 7504BDSA Machine Learning Approved 2022.01 - 20 credit points	
[MODULE] 7505BDSA Data Mining Approved 2022.01 - 20 credit points	
[MODULE] 7506BDSA High Performance Computing Approved 2022.01 - 20 credit points	
[MODULE] 7509BDSA Thesis Approved 2022.01 - 60 credit points	
Level 7 Optional - No credit points	OPTIONAL

Teaching, Learning and Assessment

Teaching, Learning and Assessment	Acquisition of the skills 1 - 19 is through a combination of lectures, tutorials, and practical sessions. These skills are assessed in a range of different assessments such as coursework, presentations and examinations. Throughout the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught / learnt and to broaden their individual knowledge and understanding of the subject.

Opportunities for work related learning

Opportunities for work related learning
This part-time programme is designed primarily for students working in relevant fields.

Entry Requirements

Type	Description
Other international requirements	The MSc in BDSA is intended to students who are capable to work with computer, algorithms and programming as well as statistical ideas and concepts. Applicants must meet the following requirements to be enrolled in the MSc in BDSA: (1) Holding a bachelor degree from a recognized academic institution with the details below. • The specialization field is in Mathematics, Statistics or computer-related disciplines (e.g. Computer Science, Computer Engineering, Network Engineering, Software Engineering, and Information Systems). Applicants from closely-related quantitative disciplines or those from business-related disciplines are also eligible to apply. • The Grade Point Average (GPA) must be at least 2.67 out of 4 (or equivalent). (2) Having a good standard (minimum grade C) statistical/mathematical background in the following areas: • Calculus • Linear Algebra • Probability and Statistics (3) Having a good standard (minimum grade C) IT background in the following areas: • Computer Programming: Java, C++, Python or R (preferable). • Data Structure • Algorithms (4) Passing a personal interview to identify potential candidates. (5) Demonstrating English Proficiency: TOEFL (500) or IELTS (6). (6) Providing two academic letters of recommendations. It is worth mentioning that students fulfil the admission criterion but who lack the required background detailed by (2) and (3) above might be asked to take up to three bridge courses (specified by the program administrative committee) prior to their enrolment to the program to equip them with the necessary knowledge and skills needed to fulfil the program advanced courses. Bridging Courses List: MATH 101 Calculus I STAT 273 Probability and Statistics ITCS 113 Computer Programming I ITCS 114 Computer Programming II ITCS 214 Data Structures

Programme Contacts

Programme Leader

Contact Name

Link Tutor

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