

TEESSIDE UNIVERSITY

Name of course: Master of Science Data Science

Module Description

[CIS4008--N] BIG DATA AND BUSINESS INTELLIGENCE

This module aims to develop the student's ability to design and implement database, big data and analytics applications to meet business needs. A case study will be used to follow the system development life cycle. The student will develop a plausible application from inception to implementation for a real-world scenario. The module will investigate the issues and technologies associated with implementing and supporting large scale databases and the services that are needed to maintain and access a repository of data. Investigations will be undertaken in a number of areas including big data, data warehouses, integrating legacy data, data management and approaches that support the modelling and visualisation of data for a range of use views.

[CIS4009-N] DATA VISUALISATION

This module explores the range of charts available from the traditional such as bar charts and pie charts, to the more novel such as stream graphs, tree maps, sunbursts, and force diagrams, and examines their mathematical properties. By accurately representing quantitative data using appropriate charts, the intended audience can make their own interpretations of the data and identify emerging patterns and themes that are more readily recognisable in chart form than in the form of raw data.

[CIS4014-N] INTERACTIVE VISUALISATION

Dynamic, interactive visualisations enable the reader to explore the data for themselves through a variety of perspectives. Static visualisations are excellent for print medium but are restricted to showing a single perspective and do not handle multidimensional datasets well. Using an interactive graphic, the reader can zoom in on sections of the data which are of interest, explore more than one dimension at a time, and sort and filter to discover new patterns and themes within the data. Particularly useful is the ability to provide a macro/micro view of the same data, i.e., a big picture view of the full dataset from which the reader can then 'drill down' into the lower-level detail. This module uses the JavaScript libraries such as Data-Driven Documents (D3js) for creating animated, dynamic graphics for the web, and looks at other alternatives available.

[CIS4027-N] STATISTICAL METHODS FOR DATA ANALYTICS

By taking this module you will develop necessary knowledge and practical understanding of the main statistical techniques. Both Quantitative and Qualitative data analysis techniques will be covered, reflecting scientific and social science methods. It will specifically focus on correlation testing, regression, data categories, normalization i.e., the tools needed, rather than the philosophical approaches. You will understand how to apply valid techniques and interpret the results in preparation for experimental work.

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[CIS4011-N] RESEARCH METHODS

This module will provide students with the knowledge and skills to understand the research process in the computing discipline and will provide them with the necessary skills to undertake their master's project. They will learn how to use and critically evaluate previous academic research, and to generate good evidence material to justify their professional practice. This will involve students learning about different research strategies and data generation methods and how they fit into primary research, the development lifecycle and the evaluation of the user experience, the use of the academic research literature, and research ethics.

[CIS4035-N] MACHINE LEARNING

This module is a subfield of computer science concerned with computational techniques rather than performing explicit programmed instructions. The methodology involves building a model of a given task based on observations to make predictions about unseen data. Such techniques are useful when the desired output is known but an algorithm is unknown, or when a system needs to adapt to unforeseen circumstances.

[CIS4055-N] COMPUTING MASTERS PROJECT

This module provides students with the opportunity to undertake a major, in-depth, individual study in an aspect of computing, IT, computer science or digital technology. Normally the master's project will be drawn from commercial, industrial or research-based problem areas. The project involves the student in researching and investigating aspects of their specific computing discipline and then producing a major deliverable (e.g., software package or tool, design, prototype, website, model, research findings, results of an experiment, datasets etc.). The student also carries out a critical evaluation of their major deliverable, including obtaining third party evaluation where appropriate.