



Module Specification

Big Data Analytics

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Part 1: Information

Module title: Big Data Analytics

Module code: UFCE3R-30-3

Level: Level 6

For implementation from: 2024-25

UWE credit rating: 30

ECTS credit rating: 15

Faculty: Faculty of Environment & Technology

Department: FET Dept of Computer Sci & Creative Tech

Partner institutions: School for Higher and Professional Education

Delivery locations: Not in use for Modules

Field: Computer Science and Creative Technologies

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides students insight into concepts, theories and developments associated with data analytics and big data. The module is focused on developing students' proficiency in handling large-scale datasets, fostering critical thinking and creativity in designing analytics solutions, and enhancing collaboration and communication skills through group projects and presentations.

Features: Not applicable

Educational aims: Throughout the module, students will explore various aspects of big data analytics, including data pre-processing, transformation, statistical and machine learning techniques, tools and frameworks, applications, case studies, and ethical and legal considerations. With a combination of lectures, interactive tutorials, labs and group projects, the module ensures a comprehensive and engaging learning experience.

Outline syllabus: Indicative content:

Introduction to Big Data: definition and characteristics of big data, data sources and formats, big data analytics lifecycle, big data analytics landscape

Data Pre-processing and Transformation: data cleaning and missing data handling, data transformation, data integration and aggregation, feature extraction and selection, dimensionality reduction techniques

Data Analysis Techniques: descriptive, diagnostics, predictive and prescriptive analytics

Statistical and Machine Learning Techniques for Big Data: supervised learning, unsupervised learning, reinforcement learning, model evaluation and validation

Data Visualisation and Communication: principles of visualisation, visualisation tools and libraries, storytelling with data, reporting and presentation of results

Big Data Analytics Tools and Framework: Hadoop and MapReduce, Apache Spark, NoSQL databases, cloud-based big data platforms

Ethical and Legal Considerations in Big Data Analytics: privacy and data security, bias and fairness, legal and regulatory frameworks, ethical considerations in data collection and analysis, responsible data management and usage

Part 3: Teaching and learning methods

Teaching and learning methods: The module is delivered through weekly lectures and lab sessions. Each lecture will direct the course and introduce the new ideas and skills required. Then small group lab sessions will enable each student to carry out the practical exercises described in the associated worksheet under the guidance of a Lab Tutor.

Scheduled learning includes lectures, tutorials and practical lab classes.

Independent learning includes time engaged with essential reading and assignment preparation and completion.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Understand the fundamental concepts, challenges, and tools associated with big data analytics and demonstrate proficiency in data pre-processing techniques for handling large datasets.

MO2 Employ various data analysis techniques, including descriptive, diagnostics, predictive and prescriptive analytics to extract valuable insights from data.

MO3 Effectively interpret, visualise and communicate the results of data analyses to support decision-making processes.

MO4 Demonstrate awareness of ethical, privacy and legal considerations in big data analytics and apply responsible data management principles.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Computer-based activities = 48 hours

Total = 300

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/07C2132B-DAA3-99CB-43E6-3859E4188B27.html) via the following link <https://rl.talis.com/3/uwe/lists/07C2132B-DAA3-99CB-43E6-3859E4188B27.html>

Part 4: Assessment

Assessment strategy: This module will be assessed through an individual data analytics portfolio worth 100% of the mark.

Students will work on a real-world data analytics project, addressing a problem or question from a specific domain (e.g., finance, healthcare, marketing).

The project will require students to apply advanced data analytics techniques, tools, and methodologies. Contextual evidence and/or sample datasets will be provided as guidance.

Assessment for this module requires students to submit a portfolio of work consisting:

(i) A written report (which will detail the research into their given topics, through description of the problem, methodology, data analysis, results and conclusions). The report should also address any ethical or privacy considerations related to the project.

(ii) The artefact developed to demonstrate the proposed solution.

(iii) A presentation of their project results to the class, demonstrating their ability to communicate complex data analysis results effectively to a diverse audience.

The resit will involve a reworking of aspects of the portfolio that do not meet the required level for a pass.

Assessment components:

Portfolio (First Sit)

Description: This module will be assessed through an individual data analytics project worth 100% of the mark. Students will work on a real-world data analytics project, addressing a problem or question from a specific domain (e.g., finance, healthcare, marketing).

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Portfolio (Resit)

Description: This module will be assessed through an individual data analytics project worth 100% of the mark. Students will work on a real-world data analytics project, addressing a problem or question from a specific domain (e.g., finance, healthcare, marketing).

The resit will involve a reworking of aspects of the portfolio that do not meet the required level for a pass.

Weighting: 100 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Information Technology {Top-Up} [SHAPE] BSc (Hons) 2024-25

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