



Module Specification

Data Analysis [TSI]

Version: 2021-22, v1.0, 26 Oct 2021

Contents

Module Specification	1
Part 1: Information	2
Part 2: Description	2
Part 3: Teaching and learning methods	3
Part 4: Assessment.....	4
Part 5: Contributes towards	6

Part 1: Information

Module title: Data Analysis [TSI]

Module code: UFMFJY-6-M

Level: Level 7

For implementation from: 2021-22

UWE credit rating: 6

ECTS credit rating: 3

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: Transport and Telecommunication Institute

Delivery locations: Transport and Telecommunication Institute Latvia

Field: Engineering, Design and Mathematics

Module type: Standard

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: The module is designed to introduce students to concepts and technologies of data analysis.

Features: Not applicable

Educational aims: Students will acquire the ability to understand and interpret statistical data output and apply modern data analysis methods for gaining new business insights.

Outline syllabus: Basic data analysis tasks and techniques review.

Big Data challenges.

Understanding and pre-processing data

Exploratory data analysis: measures of variability, heterogeneity, concentration, asymmetry.

Data visualisation.

Cluster analysis: overview, types of clustering, algorithms (k-means and hierarchical clustering) and applications of clustering.

Statistical classification: overview, classifiers (linear discriminant and logistic regression) and applications of classification.

Forecasting: overview, models (seasonal decomposition, smoothing, ARIMA).

Part 3: Teaching and learning methods

Teaching and learning methods: Learning and teaching will be provided to students in two forms: lectures and computer labs.

During lectures, theoretical aspects of the module will be provided to students by the teaching staff. Lectures will be supported by presentation published and available to the students on e.tsi.lv as well as additional materials (publications, videos, etc.).

Computer labs are devoted to practical data analysis using modern software. SPSS

will be used for illustration of techniques and output analysis; students are allowed to use other software packages (e.g., R, Python) by a prior agreement with the module instructor. Computer lab classes are reserved for requirement clarifications, problem discussion, and assessment.; students are expected to carry out the work independently outside the classes.

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

MO1 Communicate using the conventional terminology of the discipline

MO2 Identify promising business and research applications of data analysis.

MO3 Describe and apply modern methods of data exploration, clustering, classification, and forecasting.

MO4 Evaluate and explain the results of different data analysis algorithms.

MO5 Apply data analysis methods for a real data set and obtain well-grounded business insights

Hours to be allocated: 60

Contact hours:

Independent study/self-guided study = 56 hours

Face-to-face learning = 24 hours

Total = 80

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://rl.talis.com/3/uwe/lists/77B2FE68-ADB3-9601-6DC5-FC03640CE36D.html?lang=en-GB&login=1) via the following link <https://rl.talis.com/3/uwe/lists/77B2FE68-ADB3-9601-6DC5-FC03640CE36D.html?lang=en-GB&login=1>

Part 4: Assessment

Assessment strategy: Component A: Written examination

Component B consists of two elements:

Component B1: Computer lab reports (on clustering, classification, and forecasting).

The work will be carried out by students individually and independently.

Component B2: Individual research project on data analysis. This consists of a collection of data on a topic (of the student's choice) and the application of one data analysis technique.

Assessment components:

Examination - Component A (First Sit)

Description: Component A: Written Examination

a written 2-hour closed-book exam of theoretical questions. Students are expected to demonstrate their knowledge of terms and algorithms as well as understanding of general concepts of data analysis methods.

Weighting: 40 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

Laboratory Report - Component B (First Sit)

Description: Component B1: Computer Lab Report

Individual report on computer labs (clustering, classification, and forecasting). The computer labs should be conducted by students independently,

Weighting: 15 %

Final assessment: No

Group work: No

Learning outcomes tested: MO4, MO5

Report - Component B (First Sit)

Description: Element B2

Individual research project on data analysis. It entails collection of data on a topic , relating to the aviation industry, of the student choice and application of one several data analysis technique for gaining insights from this data set (1500 words)

Weighting: 45 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4, MO5

Examination - Component A (Resit)

Description: Exam (2 hours)

Weighting: 40 %

Final assessment: No

Group work: No

Learning outcomes tested:

Laboratory Report - Component B (Resit)

Description: Computer Lab Report

Weighting: 15 %

Final assessment: No

Group work: No

Learning outcomes tested:

Report - Component B (Resit)

Description: Individual research project on data analysis (1500 words)

Weighting: 45 %

Final assessment: No

Group work: No

Learning outcomes tested:

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Aviation Management and Sustainability {Double Degree} [Feb][FT][TSI][2yrs] MSc
2021-22