

## Liverpool John Moores University

Title: FUNDAMENTALS OF DATA SCIENCE  
Status: Definitive  
Code: **4117COMP** (121215)  
Version Start Date: 01-08-2021

Owning School/Faculty: Computer Science and Mathematics  
Teaching School/Faculty: Computer Science and Mathematics

Team	Leader
Wasiq Khan	Y
Andrew Laws	

**Academic Level:** FHEQ4      **Credit Value:** 20      **Total Delivered Hours:** 56.5  
**Total Learning Hours:** 200      **Private Study:** 143.5

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	33

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Data Science Exercise	60	
Exam	AS2	Examination	40	1.5

### Aims

*To introduce the notions of data, information and knowledge discovery  
To introduce the data science process and explore basic data science tools*

### Learning Outcomes

After completing the module the student should be able to:

- 1 Summarize the key concepts of data science
- 2 Explain the statistical approaches used in data science
- 3 Apply some basic data science tools
- 4 Explain and summarize the outputs of some data science tools

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Data Science Exercise	3	4
Examination	1	2

## Outline Syllabus

*Defining data science*

*The data science process*

*Identifying data problems – domain knowledge normal practice, anomalies and risks*

*Data*

*Information theory - Shannon*

*Bits, bytes, number systems and data representation*

*Data structures and data sets*

*Software tools for Data Science*

*Descriptive Statistics*

*Min*

*Max*

*Mean*

*Median*

*Mode*

*Quartiles*

*Range*

*Variance*

*Standard deviation*

*Distributions – Normal, Pareto, Poisson*

*Sampling and Sampling Distributions*

*Central Limit Theory*

*Law of Large Numbers*

*Introduction to Inferential Statistics*

*Introduction to web/data scraping and "munging"*

*Introduction to data visualization*

## Learning Activities

This module is intended to introduce the fundamental building blocks of data science. The theory introduced in lectures will be practised in laboratory sessions

**Notes**

Theory will be covered in lectures and the knowledge gained will be put into practice in laboratory sessions and coursework.