

# Unit Outline (Higher Education)

**Institute / School:** Institute of Innovation, Science & Sustainability

**Unit Title:** Data Science for All

**Unit ID:** ITECH5007

**Credit Points:** 15.00

**Prerequisite(s):** Nil

**Co-requisite(s):** Nil

**Exclusion(s):** Nil

**ASCED:** 020199

## Description of the Unit:

DATA SCIENCE FOR ALL is an introductory unit to data science, a fast-growing and exciting field. This unit will provide an overview of a number of topics that play fundamental roles across various subjects in data science. The unit features an emphasis on foundations and practical knowledge of data science, as well as computational thinking and real-world relevance. Topics to be covered include data types, data representation, data preparation, data processing and mining, data management, data exploration and visualisation. Hands-on experience working with real-world data, techniques, and tools will prepare students for advanced units and enable students to start careers as data scientists.

**Grade Scheme:** Graded (HD, D, C, P, MF, F, XF)

## Work Experience:

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment

**Course Level:**

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Learning Outcomes:

On completion of this unit, students will be able to:

#### Knowledge:

- K1.** Interpret the principles of modern data science as well as data science lifecycle.
- K2.** Differentiate between the most common forms of data types and representations.
- K3.** Critique and apply a core collection of elementary techniques for data preparation, processing, management, exploration, and visualisation.
- K4.** Examine a core collection of methods and algorithms for data analysis and mining.

#### Skills:

- S1.** Demonstrate competent skills in using data science technology for solving complex problems at an appropriate level of difficulty.
- S2.** Contrast and use data science software and tools.
- S3.** Implement any chosen data science solution and communicate the results effectively.

#### Application of knowledge and skills:

- A1.** Employ appropriate techniques and tools to process and analyse data.
- A2.** Integrate data science principles, methods, techniques and tools covered in this unit to plan and execute a data science project.

### Unit Content:

#### Topics may include:

- introduction to data and data science
- data types and representation
- foundations of algorithms and programming
- data collection, pre-processing, and wrangling
- data visualisation
- data management
- data analytics
- fundamentals of data mining
- data science tools

### FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be*

evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	<p>Students will demonstrate high-level skills to effectively communicate, interact and work with others both individually and in groups.</p> <p>Students will be required to display (in person and/or online) high-level skills in-person and/or online in:</p> <ul style="list-style-type: none"> <li>• Effective verbal and non-verbal communication via a range of synchronous and asynchronous methods</li> <li>• Active listening for meaning and influencing</li> <li>• High-level empathy for others</li> <li>• Negotiating and demonstrating extended conflict resolution skills</li> <li>• Working respectfully in cross-cultural and diverse teams</li> </ul>	K1, S3	AT1
FEDTASK 2 Leadership	<p>Students will demonstrate the ability to apply leadership skills and behaviours.</p> <p>Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>• Creating, contributing to, and enabling collegial environments</li> <li>• Showing self-awareness and the ability to self-reflect for personal growth</li> <li>• Inspiring and enabling others</li> <li>• Making informed and evidence-based decisions through consultation with others</li> <li>• Displaying initiative and ability to solve problems</li> </ul>	N/A	N/A
FEDTASK 3 Critical Thinking and Creativity	<p>Students will demonstrate an ability to work in complex and ambiguous environments, using their imagination to create new ideas.</p> <p>Students will be required to display skills in:</p> <ul style="list-style-type: none"> <li>• Reflecting critically on complex problems</li> <li>• Synthesising, evaluating ideas, concepts and information</li> <li>• Proposing alternative perspectives to refine ideas</li> <li>• Challenging conventional thinking to clarify concepts through deep inquiry</li> <li>• Proposing creative solutions in problem solving</li> </ul>	K3, K4, S2, S3	AT1, AT2
FEDTASK 4 Digital Literacy	<p>Students will demonstrate the ability to work proficiently across a range of tools, platforms and applications to achieve a range of tasks.</p> <p>Students will be required to display high-level skills in:</p> <ul style="list-style-type: none"> <li>• Finding, accessing, collating, evaluating, managing, curating, organising and appropriately and securely sharing complex digital information at a high-level</li> <li>• Receiving and responding to messages in a range of digital media</li> <li>• Using digital tools appropriately to conduct research</li> <li>• Contributing proficiently to digital teams and working groups</li> <li>• Participating in and utilising digital learning opportunities</li> </ul>	K1, K2, S1, A1, A2	AT1, AT2

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to think ethically and sustainably. Students will be required to display skills in: <ul style="list-style-type: none"> <li>• The responsible conduct of research</li> <li>• Making informed judgments that consider the impact of devising solutions in multiple global economic environmental and societal contexts</li> <li>• Demonstrating commitment to social responsibility as a professional and a citizen</li> <li>• Generating research solutions which are sustainable, ethical, socially responsible and/or sustainable</li> <li>• Extending lifelong, life-wide and life-deep learning to be open to diverse others</li> <li>• Demonstrate extended actions to foster sustainability in their professional and personal life.</li> </ul>	K1, S1, S3, A2	AT1

### Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S1-3, A1, A2	Students will apply data science principles, methods, techniques and tools to design, implement and document solutions to simple problems.	Assignments and exercises	40%-50%
K1-4, S1-3, A1	Students will provide theoretical answers and provide practical solutions to a range of questions and problems drawn from theory and examples used during the unit.	Test(s)	50%-60%

### Adopted Reference Style:

APA

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)