Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	The Data-Driven Professional
Unit ID:	ITECH5207
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	020199

Description of the Unit:

This unit provides the foundational knowledge and skills required to succeed in a professional career in which working with data and making data-driven decisions are critical. This unit provides an overview of topics that play fundamental roles across various subjects in data science and information technology including computational thinking. Topics to be covered include data types, data representation, data preparation, data processing and mining, data management, data exploration and visualisation, and ethical and professional consideration. 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-driven professionals

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

Work Experience:

No work experience

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					✔	
Intermediate						
Advanced						

Learning Outcomes:

On completion of this course, 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, representations, algorithms, and data analysis approaches.

K3. Critique and apply a core collection of elementary techniques for data preparation, processing, management, exploration, and visualisation.

K4. Outline key ethics theories, methods of ethical analysis, and principles of professional conduct, including integrity systems and the ACS Code of Professional Conduct.

K5. Formulate ethical solutions for personal responsibilities and actions linked to new technologies, considering the moral basis of public policies.

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.

S4. Access, collate, manage, and interpret digital information, with consideration of security and privacy.

S5. Apply critical thinking and problem-solving skills in multidisciplinary situations considering professional norms and safety.

Application of knowledge and skills:

A1. Employ appropriate techniques and tools to process and analyse data, and communicate the results to an expert or general audience.

A2. Integrate data science principles, methods, techniques and tools covered in this unit to plan and execute a data-driven project.

Unit Content:

Topics may include:
1. Introduction to data and data science
2. Data types and representation
3. Foundations of data-driven algorithms and programming
4. Data collection, pre-processing, wrangling, and management
5. Data analytics and visualisation
6. Fundamentals of data mining
7. Data science tools
8. Communication, networking, teamwork, workplace dynamics
9. Ethical decision-making

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**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be 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	Students at this level will demonstrate an advanced ability in a range of contexts to effectively communicate, interact and work with others both individually and in groups. Students will be required to display high level skills in-person and/or online in: • Using and demonstrating a high level of verbal and non-verbal communication • Demonstrating a mastery of listening for meaning and influencing via active listening • Demonstrating and showing empathy for others • High order skills in negotiating and conflict resolution skills\\ • Demonstrating mastery of working respectfully in cross-cultural and diverse teams.	K1, S3	AT1
FEDTASK 2 Leadership	Students at this level will demonstrate a mastery in professional skills and behaviours in leading others. • Creating and sustaining a collegial environment • Demonstrating a high level of self -awareness and the ability to self-reflect and justify decisions • Inspiring and initiating opportunities to lead others • Making informed professional decisions • Demonstrating initiative in new professional situations.	N/A	N/A
FEDTASK 3 Critical Thinking and Creativity	Students at this level will demonstrate high level skills in working in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically to generate and consider complex ideas and concepts at an abstract level • Analysing complex and abstract ideas, concepts and information • Communicate alternative perspectives to justify complex ideas • Demonstrate a mastery of challenging conventional thinking to clarify complex concepts • Forming creative solutions in problem solving to new situations for further learning.	K3, K4, S2, S3	AT1, AT2
FEDTASK 4 Digital Literacy	Students at this level will demonstrate the ability to work competently across a wide range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Mastering, exploring, evaluating, managing, curating, organising and sharing digital information professionally • Collating, managing complex data, accessing and using digital data securely • Receiving and responding professionally to messages in a range of professional digital media • Contributing competently and professionally to digital teams and working groups • Participating at a high level in digital learning opportunities.	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 at this level will demonstrate a mastery of considering and assessing the consequences and impact of ideas and actions in enacting professional ethical and sustainable decisions. Students will be required to display skills in: • Demonstrate informed judgment making that considers the impact of devising complex solutions in ambiguous global economic environmental and societal contexts • Professionally committing to the promulgation of social responsibility • Demonstrate the ability to evaluate ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Communicating lifelong, life-wide and life-deep learning to be open to the diverse professional others • Generating, leading and implementing required actions to foster sustainability in their professional and personal life	K1, S1, S3, A2	AT1

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
S2, S3, S4, S5, A1, A2	Students will apply data science principles, methods, techniques and tools to design, implement and document solutions to simple problems.	Assignments and exercises	60%-80%
K1, K2, K3, K4, S2, S3, 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)	20%-40%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool