Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Course Title:	DATA SCIENCE FOR ALL
Course ID:	ITECH5007
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	020199

Description of the Course:

DATA SCIENCE FOR ALL is an introductory course to data science, a fast-growing and exciting field. This course will provide an overview of a number of topics that play fundamental roles across various subjects in data science. The course 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 courses and enable students to start careers as data scientists.

Grade Scheme:	Graded (HD, D, C, P, MF, F, XF)
Placement Component:	No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	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 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 course to plan and execute a data science project.

Course 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**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 course, and all must be directly assessed in each program.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the course	
		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 course	
		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
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 course.	Test(s)	50%-60%

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool