Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Experiment Design and Visualisation
Unit ID:	DATSC7003
Credit Points:	15.00
Prerequisite(s):	(ITECH7001)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	020199

Description of the Unit:

EXPERIMENT DESIGN AND VISUALIZATION will focus on the application of data science techniques/tools to various domains (real-world data). It uses analytical and data science methods to solve real-world application questions and to implement the solution using tools. We will work through case studies in a variety of contexts including, e.g., business, science, healthcare, industry, education and society to investigate how knowledge and value are extracted from data. Through examining the wide-ranging applications of data science, we will further understand the underlying learning algorithms, models, codes and data. Topics will include experimental and project design, business predictive analytics, data processing, model training and evaluation, algorithm and code analysis, application cases analytics, software tools, visualisation and project management.

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:

Knowledge:

K1. Evaluate data science applications in various domains.

K2. Discriminate principles that underpin data science, experimental design, algorithms, and learning models.

K3. Integrate knowledge of data science and associated tools into ICT program and project management.

K4. Analyse, evaluate and synthesise findings from data science investigations in a form suitable for specialist and non-specialist audiences.

Skills:

S1. Critique the experimental integrity of data science project implementation.

S2. Apply data science tools to solve authentic problems based on business requirements.

Application of knowledge and skills:

A1. Utilise modelling, analysis, programming, and visualisation techniques/tools for data science projects.

A2. Select and employ relevant ICT governance standards, including ethical and social considerations, in the analysis of a real-world scenario of data science practice in industry.

Unit Content:

experimental and project design data design predictive analytics data processing model training and evaluation algorithm and code analysis application case analytics data visualisation practice software tools project management ICT governance, ethical and social considerations

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#)

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		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.	Not applicable	Not applicable
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.	Not applicable	Not applicable
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.	Not applicable	Not applicable
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.	Not applicable	Not applicable
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	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K2, K3, K4, S1, S2, A1	Develop skills in the analysis and practical application of data science techniques/tools.	Tutorials, assignments, and/or exercises	40%-60%
K1, K2, K3, K4, S1, S2, A1, A2	Students will critically evaluate a range of authetic problems drawn from case studies, including complex computing problems, to provide practical solutions.	Reports and/or presentations	40%-60%

Adopted Reference Style:

APA ()

Refer to the library website for more information

Fed Cite - referencing tool