Course Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Course Title:	EXPERIMENT DESIGN AND VISUALIZATION
Course ID:	DATSC7003
Credit Points:	15.00
Prerequisite(s):	(ITECH7001)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	020199

Description of the Course:

DATA SCIENCE CASE STUDIES 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: Student is not undertaking work experience in industry.

Does Recognition of Prior Learning apply to this course? No

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:

Knowledge:

K1. Contrast data science applications in various domains.

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

K3. Integrate knowledge of data science and associated tools for developing authentic data science projects.

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

Skills:

S1. Critically evaluate the keys to successful data science project implementation.

S2. Effectively apply data science knowledge and techniques to solve authentic problems.

S3. Design and execute a data science project based on business requirements, and reflect on the experience.

Application of knowledge and skills:

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

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

Course 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
- 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 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.	K3, K4, S3, A2	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	K4, S3, A1, A2	AT1
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	K1, K2, K4, S1, 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	K2, K3, S2, A1	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, K4, S3, A2	AT1

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1-4, S1-3, A1	Develop skills in the analysis and practical application of data science techniques/tools.	Tutorials, assignments, and/or exercises	40%-60%
K1-4, S1-3, A1-A2	Students will provide theoretical answers and provide practical solutions to a range of questions and problems drawn from case studies.	Test(s)	40%-60%

Alignment to the Minimum Co-Operative Standards (MiCS)

The Minimum Co-Operative Standards (MiCS) are an integral part of the Co-Operative University Model. Seven criteria inform the MiCS alignment at a program level. Although courses must undertake MiCS mapping, there is NO expectation that courses will meet all seven criteria. The criteria are as follows:

1. Co-design with industry and students
2. Co-develop with industry and students
3. Co-deliver with industry
4. FedTASK alignment
5. Workplace learning and career preparation
6. Authentic assessment
7. Industry-link/Industry facing experience

MiCS program level reporting highlights how each program embraces the principals and practices associated with the Co-Operative Model. Evidence of program alignment with the MiCS, can be captured in the Program Modification Form.

MICS Mapping has been undertaken for this course   No

Date:

Adopted Reference Style:

APA

Refer to the library website for more information

Fed Cite - referencing tool