Unit Outline (Higher Education)

Institute / School: Institute of Education, Arts & Community

Unit Title: MATHEMATICS AND INTRODUCTORY STATISTICS

Unit ID: FASTP1013

Credit Points: 15.00

Prerequisite(s): Nil

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 120199

Description of the Unit:
This unit is designed to develop confidence and positive attitudes towards mathematics through a thorough understanding of foundational concepts and skills. Students will be encouraged to communicate their mathematical ideas, developed from agreed upon basic principles.
The key sections will be on development of skills in arithmetic, algebra and statistics. The focus will be on students understanding and ability to explain their reasoning, rather than purely on getting the correct answer.

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 Unit? No

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 and submitted all major assessment tasks.

CourseLevel:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	✔					
Intermediate						

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Advanced						

Learning Outcomes:

After successfully completing this course students will be able to:

Knowledge:

K1. conceptualise and explain the meaning of place value and the decimal system, factors and multiples, prime and composite numbers, and directed numbers

K2. conceptualise and explain the four basic operations of addition, subtraction, multiplication and division, exponential notation, number patterns and order of operations

K3. conceptualise and explain the connection between fractions, decimals, percentages, percentage change, GST, simple interest, and compound interest

K4. conceptualise and explain how to add, subtract, divide and multiply fractions by whole numbers and by other fractions

K5. conceptualise and explain the use of scientific notation and significant figures

K6. conceptualise and explain expressions that contain variables (pronumerals, or letters of the alphabet) together with numbers using like and unlike terms

K7. conceptualise and explain the meaning of equality as an intrinsic mathematical notion, allowing them to solve otherwise intractable problems (linear equations)

K8. conceptualise and explain units of length, area, volume, capacity and time, finding perimeter, area, volume, and capacity, Pythagoras' theorem

K9. conceptualise and explain angles and polygons

K10. identify, conceptualise, and explain probability of an event, union, and intersection

K11. identify, conceptualise, and explain the addition rule, independent events, and conditional probability

K12. conceptualise and explain two-way tables and tree diagrams

K13. identify, conceptualise, and explain the difference between numerical and categorical data

K14. organise data, display data, and explain shape

K15. conceptualise and explain summary statistics

Skills:

S1. use the four basic operations of addition, subtraction, multiplication and division, as well as exponential notation

S2. demonstrate financial numeracy and literacy

S3. competently work with fractions decimals and percentages

S4. work with expressions that contain variables (pronumerals, or letters of the alphabet) together with numbers

S5. use equality as an intrinsic mathematical notion to solve otherwise intractable problems

S6. demonstrate abilty to work with different shapes: measurement and geometry

S7. utilise prediction using probability

S8. present statistical data in useful ways

Application of knowledge and skills:

A1. add, subtract, divide and multiply fractions by whole numbers and by other fractions

A2. add, subtract, divide and multiply decimals and percentages
A3. solve problems involving fractions percentages and decimals
A4. use measurement and geometry to work with shapes
A5. use probability to predict occurance of events
A6. create and interpret data and graphs in order to come to logical and useful conclusions

Unit Content:

Topics may include:

- Number and Algebra:
  - factors and multiples
  - prime and composite numbers
  - directed numbers and index notation
  - decimals , fractions, and percentages
  - GST, simple interest, compound interest
  - scientific notation and significant figures
  - number patterns and order of operations
  - language of algebra
  - expanding brackets and solving linear equations
- Measurement and Geometry:
  - units of length, area, volume, capacity and time
  - finding perimeter, area, volume, and capacity
  - Pythagoras' theorem
  - angles and polygons
- Statistics and probability:
  - data presentation
  - measures of central tendency
  - measures of spread
  - probability of an event
  - union and intersection
  - addition rule, independent events, conditional probability
  - two way tables and tree diagrams

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 attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	**Assessment task (AT#)**
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, interact and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating conflict resolution skills • Working respectfully in cross-cultural and diverse teams.	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving	K1 - K15; S1 - S8; A1 - A6	AT1, AT2, AT3
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities	K14 - K15, S8, A6	AT3
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • 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 - K7; S1 - S5; A1 - A3	Number and Algebra - Simple application tasks will be given as Moodle quizzes (one per week up to 10 weeks)	Moodle quizzes	15-25%
K8 - K9; S6; A4	Measurement and Geometry: a) Application task (groups of 3 or 4) b) Problem solving task (individual)	Written Assignment	30-50%
K10 - K15; S7 - S8; A5 - A6	Probability and Statistics Application task using Excel (individual task)	(a). Written assignment - 60% (b). 3 - 5 minutes interview via Teams in Week 13 (This will be recorded) - 40%	30-50%

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 Course level. Although Units must undertake MiCS mapping, there is NO expectation that Units 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 Course level reporting highlights how each Course embraces the principles and practices associated with the Co-Operative Model. Evidence of Course alignment with the MiCS, can be captured in the Course Modification Form.

MICS Mapping has been undertaken for this Unit No

Date:

Adopted Reference Style:

Refer to the library website for more information

Fed Cite - referencing tool