



# Course Outline (Higher Education)

<b>School:</b>	School of Engineering, Information Technology and Physical Sciences
<b>Course Title:</b>	STATISTICS AND R
<b>Course ID:</b>	STATS5000
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	Nil
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	Nil
<b>ASCED:</b>	010103

## Description of the Course :

This course introduces students to statistical data analysis methods using R software. Examples and problem sets are utilised from various disciplines to demonstrate the link between statistical concepts and implementation, with emphasis on interpretation and communication of statistical results and conclusions. R programming forms the basis of all statistical analyses and data visualisation.

**Grade Scheme:** Graded (HD, D, C, etc.)

**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.** Describe a set of data using appropriate statistical measures.
- K2.** Recognise the role of hypothesis tests in statistics.
- K3.** Describe the relationship between two variables using linear regression.
- K4.** Present clear, orderly and informative statistical summaries and technical reports.

**Skills:**

- S1.** Use R software to perform routine data management tasks and statistical analyses.
- S2.** Perform formal statistical analysis of data from a variety of disciplines.
- S3.** Summarise data using graphs and tables.
- S4.** Perform appropriate hypothesis tests using R software.
- S5.** Obtain a simple linear regression model and determine the model functionality.
- S6.** Perform one- and two-way analyses of variance (ANOVA).
- S7.** Communicate results from statistical analyses using appropriate statistical conventions.

**Application of knowledge and skills:**

- A1.** Select and perform appropriate statistical analysis for given data sets and problem situations.

**Course Content:**

Topics may include:

- Introduction to the R environment.
- Data presentation and basic descriptive statistics.
- Discrete and continuous probability distributions.
- Estimation and hypothesis testing (t-tests for single sample, paired and independent).
- Non-parametric alternatives.
- ANOVA
- Chi-square tests.
- Simple linear regression.

**Values:**

- V1.** Appreciate the role of statistics in their particular disciplines.
- V2.** Appreciate the need for advanced statistical computer packages like R for data analysis.
- V3.** Appreciate the need to produce clear, orderly and informative statistical summaries and reports.
- V4.** Recognise the ethical requirements in presenting summarised data from statistical analysis.

**Graduate Attributes**

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1-K3, S1-S6, A1	A	AT1-AT3	A
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	N/A	N/A	N/A	N/A
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	N/A	N/A	N/A	N/A
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K4,S7	B	AT1, AT2	B, B
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	N/A	N/A	N/A	N/A

**Learning Task and Assessment:**

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-4, S1-7, A1	Weekly lab activities	Online quizzes	10-20%
K1-4, S1-3, S7, A1	Statistical analysis, data visualisation and interpretation.	Assignment	20% - 30%
K1-4, S4 and S7, A1	Summative tasks, but with more emphasis on hypothesis testing in the context of different real-world problems, and model development: simple linear regressions vs ANOVA with practical applications.	Test(s)	40% - 60%

**Adopted Reference Style:**

APA