COURSE OUTLINE

ANM203 Statistics with Teeth: Understanding Ecological Data

School: School of Science, Technology and Engineering

2025 | Semester 2

UniSC Sunshine Coast
UniSC Moreton Bay

BLENDED LEARNING — Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

During this course, you will learn how to use fundamental statistical programming techniques to solve numerical problems in Animal Ecology. You will consolidate your skills in manipulating and summarising data, before progressing towards building your own simple ecological models of the type that underpin modern research in Animal Ecology. Most approaches will be explored from the context of the general linear model, gradually building sophistication to culminate in explanatory and predictive techniques including generalized linear models, classification trees and regression trees.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – An hour of online video-based learning materials will be available each week for review. Discussion of the content of these materials will happen at the start of each laboratory.	1hr	Week 1	13 times
Laboratory 1 – Computer Lab	3hrs	Week 1	13 times

1.3. Course Topics

An introduction to the philosophy of science, a review of data handling and manipulation, the fundamentals of statistical programming in R, working with Normal data (general linear modelling), working with non-Normal data (generalized linear modeling), pattern-recognition (classification and regression trees).

2. What level is this course?

200 Level (Developing)

Building on and expanding the scope of introductory knowledge and skills, developing breadth or depth and applying knowledge and skills in a new context. May require pre-requisites where discipline specific introductory knowledge or skills is necessary. Normally, undertaken in the second or third full-time year of an undergraduate programs.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...		GRADUATE QUALITIES Completing these tasks successfully will contribute to you becoming...
1	Demonstrate scholarly good practice in acquiring, manipulating, analyzing, storing and presenting data.	Creative and critical thinker Ethical
2	Connect concepts from different disciplines and apply relevant theory to identify and solve problems.	Knowledgeable Creative and critical thinker
3	Identify and solve problems systematically, demonstrating the ability to select from among a range of techniques.	Creative and critical thinker Empowered
4	Employ logical reasoning and empirical support to arrive at independent conclusions.	Creative and critical thinker Empowered
5	Communicate effectively and coherently in written and oral forms, using correct terminology, appropriate formats.	Empowered Ethical

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1. Pre-requisites

SCI110 or BUS101

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

You will have prior knowledge and skills in: basic design of quantitative research; foundational statistical concepts (measures of central tendency and dispersion, sampling, graphs); and elementary statistical tests (t-tests and correlation).

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

Over the first four Weeks of this Course, you will work with your peers in a group setting to develop a document outlining a survey or experimental design for a real-world research problem. During this process, you will receive formative feedback from your peers about your level of understanding of the introductory concepts required by this Course. Summative assessment (assigned marks) of your submitted Research Design (see Task 1, below), will be accompanied by extensive formative feedback.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Written Piece	Group	30%	1000 words +/- 15 %	Week 4	Online Assignment Submission with plagiarism check
All	2	Artefact - Technical and Scientific	Individual	20%	1000 words +/- 15 %	Week 8	Online Assignment Submission with plagiarism check
All	3	Artefact - Technical and Scientific	Individual	50%	3000 words +/- 15 %	Week 13	Online Assignment Submission with plagiarism check

All - Assessment Task 1: Research Design

GOAL:	In this Task, you will demonstrate your understanding of the philosophy and practice of ecological science by articulating a problem as a research question, by developing a conceptual model that will yield predictions, by converting these predictions into testable hypotheses, by specifying such hypothesis, and by explaining how you would go about designing a survey or experiment that would yield real-world data with which you may be able to test your hypotheses. This Task will comprise both formative and summative elements.
PRODUCT:	Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	From the list of problems provided, select ONE, and prepare a short, written report of 1000 words ± 15% that outlines your survey/experimental design. You may include diagrams/illustrations, where these are necessary to elaborate the points you wish to make.
CRITERIA:	

No.		Learning Outcome assessed
1	Appropriateness of your research questions;	2 3
2	Precision and logic of predictions and hypotheses;	3 5
3	Robustness of proposed survey or experimental design and resulting data in the context of stated predictions, hypotheses and research question;	2 5
4	Reflection on strengths and weaknesses of your survey/experimental design.;	2
5	Your ability to work in a team.	5

GENERIC SKILLS:	Communication, Collaboration, Problem solving, Organisation

All - Assessment Task 2: Data Analysis Script 1

GOAL:	In this Task, you will demonstrate your ability to import, manipulate and store data in R, to use these data to construct, fit, assess and interpret basic statistical models, and to present associated R scripts in a form that describes all of these steps and that also presents the results appropriately. This Task will comprise both formative and summative elements.
PRODUCT:	Artefact - Technical and Scientific
AUTHORSHIP STATEMENT:	
FORMAT:	From the list of problems provided, select ONE, and prepare an annotated R script of 1000 words ± 15%, which you will compile into an MS Word file for submission.
CRITERIA:	

No.		Learning Outcome assessed
1	Clarity and completeness of scripting;	4 5
2	Appropriateness of data manipulation and analysis;	1 3 4
3	Quality of resulting outputs;	1 5
4	Appropriateness and accuracy of rationale/explanation and interpretation of results.	2 3 4 5

GENERIC SKILLS:	Communication, Problem solving, Organisation, Applying technologies, Information literacy

All - Assessment Task 3: Data Analysis Script 2

GOAL:	This final assignment will provide you with the opportunity to demonstrate the full range of skills you have developed during the course. This Task will comprise mainly summative elements.
PRODUCT:	Artefact - Technical and Scientific
AUTHORSHIP STATEMENT:	
FORMAT:	From the list of problems provided, select ONE, and prepare an annotated R script of 3000 words +/- 15%, which you will compile into an MS Word file for submission.
CRITERIA:	

No.		Learning Outcome assessed
1	Precision and logic of predictions and associated hypothese	2 3 5
2	Quality of analyses, including their justification and correctness;	1 3 4 5
3	Depth of understanding of the analyses, and interpretation of the associated results;	4 5
4	Clarity and completeness of scripting;	4 5
5	Overall presentation of final script and associated outputs.	1 5

GENERIC SKILLS:	Communication, Problem solving, Organisation, Applying technologies, Information literacy

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Recommended	Michael J. Crawley	2012	The R Book	2nd Edition	John Wiley & Sons

8.2. Specific requirements

None, although a personal laptop computer would be useful.

9. How are risks managed in this course?

Health and safety risks for this course have been assessed as low. It is your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate: - 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task. - 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task. - A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

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