UniSC

COURSE OUTLINE

ICT706 Machine Learning

School: School of Science, Technology and Engineering

2024 | Trimester 2

UniSC Sunshine Coast	**BLENDED LEARNING**	Most of your course is on campus but you may be able to do some components of this course online.
Online	**ONLINE**	You can do this course without coming onto campus.

Please go to usc.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

Massive amounts of data are collected in almost every corner of the world, and they become the new strategic mechanisms for intelligent businesses. This course covers both foundational knowledge and more advanced practical skills about data processing and analysis. It explores the use of, and techniques used in, exploratory, descriptive, and predictive analytics. Combining technical and statistical skills, analytical thinking, and business acumen, it helps you to harness the power of data analytics.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous Learning material	2hrs	Week 1	12 times
Tutorial/Workshop 1 – Synchronous on campus workshop	2hrs	Week 1	12 times
Seminar – On campus seminar	1hr	Week 1	2 times
ONLINE			
Learning materials – Asynchronous Learning material	2hrs	Week 1	12 times
Tutorial/Workshop 1 – Synchronous Zoom workshop	2hrs	Week 1	12 times
Seminar – Online seminar	1hr	Week 1	2 times

1.3. Course Topics

Introduction to data analytics and data science

Data quality issues and pre-processing

Exploratory data analysis and visualisation

Data relationships: association rules and clustering

Machine learning: linear regression, decision trees, deep learning, artificial neural networks

2. What level is this course?

700 Level (Specialised)

Demonstrating a specialised body of knowledge and set of skills for professional practice or further learning. Advanced application of knowledge and skills in unfamiliar contexts.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES	GRADUATE QUALITIES
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...
1 Demonstrate a specialised and integrated understanding of contemporary data science and business analytics theories and practices.	Knowledgeable Empowered
2 Use data mining, machine learning and data analysis techniques to develop relevant and rigorous models to gain business insights.	Knowledgeable Creative and critical thinker
3 Investigate, evaluate, and plan the lifecycle of data through an organisation.	Knowledgeable
4 Apply computer technology in the solution of business analytics problems.	Creative and critical thinker Engaged

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

ICT703

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

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

Feedback will be provided for the formative exercises in the weekly computer workshops. This feedback will give students immediate feedback on their understanding and progress in the course.

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	Examination - not Centrally Scheduled	Individual	10%	1 hour	Week 6	Online Test (Quiz)
All	2	Artefact - Technical and Scientific, and Written Piece	Individual	40%	2,000 words	Week 11	Online Assignment Submission with plagiarism check
All	3	Examination - not Centrally Scheduled	Individual	50%	2 hours	Exam Period	Online Test (Quiz)

All - Assessment Task 1: Data analytics test

GOAL:	To learn about the concepts of machine learning using hands on tools. This task enables you to apply computer tools to solve business problems
PRODUCT:	Examination - not Centrally Scheduled
FORMAT:	Individual online exam. Further details will be available on Canvas.

CRITERIA:	**No.**		**Learning Outcome assessed**
	1	Selection, adaption and design of solutions using machine learning techniques	4

All - Assessment Task 2: Research project

GOAL:	To undertake a data analytics approach to solve a set of business problems that require the use of appropriately selected data processing and mining approaches.
PRODUCT:	Artefact - Technical and Scientific, and Written Piece
FORMAT:	This is an individual assessment. The assessment will report the set of business problems, data required, and data mining tools selected to solve the selected problems. Further details will be available on Canvas.

CRITERIA:	**No.**		**Learning Outcome assessed**
	1	Development of data processing and mining solutions to solve a business problems	4
	2	Analysis of data analysis methods used in an organisation	2
	3	Clear summary of relevant information and outcomes	1

All - Assessment Task 3: Final Examination

GOAL:	This assessment task will demonstrate your knowledge and application of all material covered in this course.
PRODUCT:	Examination - not Centrally Scheduled
FORMAT:	A final examination will be held in the examination period. This is an individual assessment.

CRITERIA:	**No.**		**Learning Outcome assessed**
	1	Demonstration of skills and knowledge in the data analytics and machine learning	1 3

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

Please note that you need to have regular access to the resource(s) listed below. Resources may be required or recommended.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Required	Foster Provost,Tom Fawcett	2013	Data Science for Business	n/a	Oreilly & Associates Incorporated

8.2. Specific requirements

Not applicable

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. SafeUniSC

UniSC is committed to a culture of respect and providing a safe and supportive environment for all members of our community. For immediate assistance on campus contact SafeUniSC by phone: 07 5430 1168 or using the SafeZone app. For general enquires contact the SafeUniSC team by phone 07 5456 3864 or email safe@usc.edu.au.

The SafeUniSC Specialist Service is a Student Wellbeing service that provides free and confidential support to students who may have experienced or observed behaviour that could cause fear, offence or trauma. To contact the service call 07 5430 1226 or email studentwellbeing@usc.edu.au.

10.5. Study help

For help with course-specific advice, for example what information to include in your assessment, you should first contact your tutor, then your course coordinator, if needed.

If you require additional assistance, the Learning Advisers are trained professionals who are ready to help you develop a wide range of academic skills. Visit the Learning Advisers web page for more information, or contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au.

10.6. Wellbeing Services

Student Wellbeing provide free and confidential counselling on a wide range of personal, academic, social and psychological matters, to foster positive mental health and wellbeing for your academic success.

To book a confidential appointment go to Student Hub, email studentwellbeing@usc.edu.au or call 07 5430 1226.

10.7. AccessAbility Services

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, learning disorder mental health issue, injury or illness, or you are a primary carer for someone with a disability or who is considered frail and aged, AccessAbility Services can provide access to appropriate reasonable adjustments and practical advice about the support and facilities available to you throughout the University.

To book a confidential appointment go to Student Hub, email AccessAbility@usc.edu.au or call 07 5430 2890.

10.8. 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

10.9. 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.

10.10. 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

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au