COURSE OUTLINE

GEO301 Mapping with Drones

School: School of Science, Technology and Engineering

2026 | Trimester 1

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.
Online	ONLINE	You can do this course without coming onto campus, unless your program has specified a mandatory onsite requirement.

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

This course will introduce you to the application of drones as mapping platforms for environmental applications. You will learn about the basics of aerodynamics, flight navigation systems, legislation, data analysis and have hands-on practical experience flying small drones (< 2 kg). The emphasis of the course is on employing rigorous science for processing imagery acquired with drones and deriving and visualising a range of 3D mapping products.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous online delivery of learning material	1hr	Week 1	12 times
Tutorial/Workshop 1 – Synchronous and scheduled face to face computer Workshops	2hrs	Week 2	8 times
Tutorial/Workshop 2 – Synchronous and scheduled face to face tutorials.	2hrs	Week 1	3 times
Fieldwork – Face to face fieldwork	8hrs	Week 8	Once Only
ONLINE			
Learning materials – Asynchronous online delivery of learning	1hr	Week 1	12 times
Tutorial/Workshop 1 – Synchronous and scheduled online computer Workshops	2hrs	Week 2	8 times
Tutorial/Workshop 2 – Synchronous and scheduled online tutorials.	2hrs	Week 1	3 times
Fieldwork – Virtual Fieldwork (attendance at the physical fieldwork is encouraged if possible)	8hrs	Week 8	Once Only

1.3. Course Topics

• Drone platforms and navigation systems

• Drone regulations

• Mapping and monitoring drone applications for environmental science and management

• 3D photogrammetry and Structure from Motion algorithms

• Planning mapping missions

• 3D visualisation

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth full-time study year of an undergraduate program.

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 MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Australian Learning & Teaching Council
1 Explain fundamental concepts about using drones as platforms for mapping the environment	Knowledgeable Ethical	1, 2
2 Design, use and evaluate different approaches to field data collection methods and interpret and analyse data collected with drones	Creative and critical thinker Engaged	3, 5
3 Search, select and critically review relevant academic information and communicate findings orally and/or writing	Creative and critical thinker	3, 6, 7

* Competencies by Professional Body

CODE	COMPETENCY
AUSTRALIAN LEARNING & TEACHING COUNCIL	
1	Knowing: Demonstrate a coherent geographical understanding of trends, processes and impacts that shape Australian and other environments and/or societies at different spatial and temporal scales.
2	Knowing: Demonstrate an understanding of Geography as an academic discipline, including awareness of its concepts, history and principal subfields, whilst acknowledging the contested, provisional and situated nature of geographical understanding.
3	Thinking: Apply geographical thought creatively, critically and appropriately to specific spaces, places and/or environments.
5	Investigating and problem solving: Resolve geographical questions by ethical means, applying evidence-based knowledge and appropriate research techniques, including those associated with field work.
6	Communicating: Communicate geographical perspectives and knowledge effectively to specialist and non-specialist audiences using appropriately selected written, oral and visual means.
7	Self-directing and collaborating: Contribute effectively as a member or leader of diverse teams working in geographical or multidisciplinary contexts

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

GEO100 or ENS253

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

GIS and remote sensing

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

Early feedback on the structure for Assessment product Task 2 report will be given during week 4.

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	Quiz/zes	Individual	15%	During computer workshop	Refer to Format	Online Assignment Submission with plagiarism check
All	2	Report	Individual	45%	2000 words	Week 7	Online Assignment Submission with plagiarism check
All	3	Oral and Written Piece	Group	40%	2,000 words and 10 minutes per group	Refer to Format	Online Assignment Submission with plagiarism check and in class

All - Assessment Task 1: Computer workshop quizzes

GOAL:	To develop your theoretical and practical skills in using drones for mapping applications
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	At the end of the computer workshops you will complete a quiz/short technical report and submit via Turnitin.
CRITERIA:	

No.		Learning Outcome assessed
1	Depth of understanding about principles of flying	1
2	Depth of understanding about flying legislation	1
3	Interpretation and analysis of data collected with drones.	2

GENERIC SKILLS:	Communication, Problem solving, Applying technologies

All - Assessment Task 2: Technical report

GOAL:	To identify, interpret and communicate key concepts about mapping the environment with drones and to analyse and report drone-derived data.
PRODUCT:	Report
AUTHORSHIP STATEMENT:	
FORMAT:	The report should synthesise and communicate results derived from computer workshops in a clear and concise writing style. The length should be a maximum of 2000 words and the structure should follow a conventional scientific report template.
CRITERIA:	

No.		Learning Outcome assessed
1	Explain key concepts about mapping with drones and provide supportive evidence from appropriate literature (relevant, current, credible)	1 3
2	Demonstrate skills in data analysis and presentation of results	2
3	Structure, clarity and style of the written assignment	3

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

All - Assessment Task 3: Field trip report

GOAL:	To present the methodology and results obtained from fieldwork, including the analysis and discussion of data/evidence collected and conclusions derived from the results
PRODUCT:	Oral and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	A concise scientific report based on data collected by each group. The written report is due Week 12 and should be around 2,000 words and written in the style of a manuscript for publication in the peer-reviewed literature, including a reference list, as well as tables and illustrations, as needed. Each group will also present their main findings as an oral presentation during weeks 11 and 12 seminars.

CRITERIA:

No.		Learning Outcome assessed
1	Application of theoretical and practical knowledge.	1
2	Use of measuring methods and tools to collect data and produce 3D products and classified maps.	2
3	Accurate interpretation and analysis of data	2
4	Critical analysis of advantages and limitations of applied methods	3
5	Communication, both orally and in structured writing, to informed audiences in a field report, using supporting scholarly sources and data	3
6	Demonstration of collaboration and working well in a group.	3
7	Quality of presentation, grammar and spelling	3

GENERIC SKILLS:	Communication, Collaboration, 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	Sharma, J. B.	2019	Applications of small unmanned aircraft systems : best practices and case studies	n/a	Boca Raton, Florida : CRC Press/Taylor & Francis Group
Recommended	Jonathan Carrivick,Mark Smith,Duncan Quincey	2016	Structure from Motion in the Geosciences	n/a	Hoboken: John Wiley & Sons, Incorporated

8.2. Specific requirements

Access to a Windows-based computer for running software.

Field work is a significant component for this course. You will be required to undertake field work, where you will need to wear covered footwear, hat, long-sleeved shirt and long trousers for field safety. Detailed time, location and potential costs will be set out at the beginning of the trimester. Discuss any financial hardship that might be associated with the field studies with the Course Coordinator.

9. How are risks managed in this course?

Risk assessments have been performed for all field activities and low to moderate levels of health and safety risk exists. Moderate risks may include working in an Australian bush setting, working with people, working outside normal office hours for example. 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:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

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

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central