USC

COURSE OUTLINE

GEO301 Mapping with Drones

Course Coordinator: Javier Leon Patino (jleon@usc.edu.au) **School:** School of Science, Technology and Engineering

2021 | Semester 1

| USC Sunshine Coast | | ON CAMPUS | Most of your course is on campus but you may be able to do some components of this course online. |

Please go to the USC website 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 and classification products.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
ON CAMPUS			
Lecture	2hrs	Week 1	13 times
Tutorial/Workshop – Computer workshop	2hrs	Week 1	11 times
Fieldwork	4hrs	Week 7	Once Only

1.3. Course Topics

• Drone platforms and navigation systems

• Drone applications for environmental science and management

• Imagery processing with Structure from Motion algorithms

• Classification of hyper-spatial data

• Terrain analysis

• 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 Completing these tasks successfully will contribute to you becoming...
1 Explain fundamental concepts about using drones as platforms for mapping the environment	Knowledgeable Ethical
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 Search, select and critically review relevant academic information and communicate findings orally and/or writing	Creative and critical thinker

5. Am I eligible to enrol in this course?

Refer to the USC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1. Pre-requisites

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

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 2 report will be given during week 4. Feedback on the topic selection and structure for Assessment product 3 will be given during week 8.

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
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: Quizzes

GOAL:	To develop your theoretical and practical skills in using drones for mapping applications
PRODUCT:	Quiz/zes
FORMAT:	During computer workshops you will be provided with reading material and exercises. At the end of the computer workshop you will complete an online quiz and submit via Blackboard.

CRITERIA:	No.		Learning Outcome assessed
	1	Depth of understanding about principles of flying	
	2	Depth of understanding about flying legislation	
	3	Assessment criteria are mapped to the course learning outcomes.	① ② ③

All - Assessment Task 2: Technical report

GOAL:	To identify, interpret and communicate an overview of key concepts in processing and reporting drone-derived data.
PRODUCT:	Report
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	Identification of appropriate literature (relevant, current, credible)	
	2	Demonstrate skills in data analysis and presentation of results	
	3	Structure, clarity and style of the written assignment	

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
FORMAT:	A concise scientific report based on data collected by each group. The written report 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, which will include a 3D visualisation of results. Submit week 12 and week 13.

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

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. Directed study hours may vary by location. 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 Blackboard site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

There are no required/recommended resources for this course.

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 semester. 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 Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

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. 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.

10.5. 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.

10.6. 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.

10.7. 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
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website: http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.8. General Enquiries

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

Tel: +61 7 5430 2890
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