



COURSE OUTLINE

ENS305 Environmental Chemistry

Course Coordinator: David McKay (dmckay@usc.edu.au) School: School of Science, Technology and Engineering

2021 Semester 2

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 focuses on chemical processes in the Earth's pedosphere (soil surface), hydrosphere and atmosphere. It covers chemical, together with some physical, interactions between air, water and soil, with relevant links to biogeochemical cycles and ecology. It is a knowledge-based course that includes conceptual understanding together with a range of field and laboratory skills. It will allow students to examine and analyse soil, sediment, water, and air samples to determine key environmental parameters, and how to evaluate and present their results in a scientific manner.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
ON CAMPUS			
Laboratory 1 – Wet Lab Weeks 1 3 7 9 and 11	3hrs	Week 1	5 times
Fieldwork	5hrs	Week 5	Once Only
Lecture	2hrs	Week 1	13 times

1.3. Course Topics

1. System Science and Environmental Chemistry
2. Intro atmospheric chemistry
3. Stratospheric chemistry and the Ozone Hole; Field excursion: on Sippy Downs campus – collecting samples and in-situ analyse of lake and stream water, and soil and sediment samples. Timing of field excursion to be announced.
4. Tropospheric Chemistry
5. Aerosol and Cloud Chemistry
6. Greenhouse Gases and Climate Change
7. Intro to Aquatic Chemistry
8. Heavy Metals and Organics
9. Biosensors
10. Water Pollution
11. Water Pollution and Radioactivity
12. Groundwater
13. Soil Chemistry

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	GRADUATE QUALITIES
On successful completion of this course, you should be able to...	Completing these tasks successfully will contribute to you becoming...
① Propose and justify ethical, Sustainability-focussed solutions to current and potential environmental chemistry problems	Ethical Sustainability-focussed
② Demonstrate and apply knowledge of environmental chemistry incorporating regional and global perspectives	Knowledgeable
③ Design, optimise and demonstrate environmental chemistry experiments	Empowered Engaged
④ Communicate in scientific writing and orally (to post graduate students and staff)	Empowered

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

SCI105

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

Task 1 is the field trip and occurs during weeks 3 and 4. While the final report for the field trip is not due until the end of week 11, draft reports are completed during week 4 and feedback is provided.

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	Report	Group	40%	1 x 2000 words	Week 11	Online Assignment Submission with plagiarism check
All	2	Examination	Individual	20%	1 hour, <1000 words	Week 7	In Class
All	3	Examination - Centrally Scheduled	Individual	40%	2 hours < 1500 words	Exam Period	Online Test (Quiz)

All - Assessment Task 1: Field excursion and laboratory report

GOAL:	Produce environmental chemistry data (from field excursion and laboratory experiments) in teams and compare this with the literature to write a group report	
PRODUCT:	Report	
FORMAT:	Title, abstract, introduction, methods, results, discussion, conclusion, references. Report submitted through Safe Assign.	
CRITERIA:	No.	Learning Outcome assessed
	1 Analyse environmental chemistry information in formal contexts.	3
	2 Analyse data and effectively communicate.	4

All - Assessment Task 2: Mid-semester examination

GOAL:	Demonstrate and apply knowledge of environmental chemistry and propose and justify solutions to problems	
PRODUCT:	Examination	
FORMAT:	Short and extended answer, problem solving, calculations based on material from lectures, tutorials, laboratory and field activities to date.	
CRITERIA:	No.	Learning Outcome assessed
	1 Apply and discuss key concepts in relation to environmental chemistry and sustainability.	1
	2 Effectively communicate both orally and in scientific writing.	4

All - Assessment Task 3: Final Exam

GOAL:	Demonstrate and apply knowledge of environmental chemistry and propose and justify solutions to problems	
PRODUCT:	Examination - Centrally Scheduled	
FORMAT:	Short and extended answer, problem solving, calculations based on material from lectures, tutorials, laboratory and field activities.	

CRITERIA:	No.	Learning Outcome assessed
	1 Demonstrate and apply knowledge of environmental chemistry incorporating regional and global perspectives	1 2 4
	2 Propose and justify ethical, sustainability-focused solutions to current and potential environmental chemistry problems	1 2 4

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

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	PUBLISHER
Recommended	n/a	0	Environmental Chemistry	Baird and Cann

8.2. Specific requirements

Laboratory coat, safety glasses, closed in footwear for laboratory.

9. How are risks managed in this course?

Risk assessments have been performed for all laboratory classes and a moderate level of health and safety risk exists. Moderate risks are those associated with laboratory work such as working with chemicals and hazardous substances. You will be required to undertake laboratory induction training and it is also 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

Email: studentcentral@usc.edu.au