

SCI105 Introductory Chemistry

School: School of Science, Technology and Engineering

2024 | Semester 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.

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

This introductory course provides the chemical concepts essential for science, engineering and education. You study atomic theory, the Periodic Table, chemical bonding and reactions, electrochemistry, fundamentals of chemical thermodynamics including a general introduction to chemical equilibria, reaction kinetics, and the properties of gases, liquids and solutions. The course also explains the properties of acids and bases, the concept of pH, and buffer systems. An introduction to organic chemistry is provided. You work in teams in the laboratory to investigate chemical concepts.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Learning Materials are available online and delivered asynchronously. Learning Materials consist primarily of formative quizzes and interactive screencasts. Other available materials include simulations and on-line demonstrations.	2hrs	Week 1	13 times
Tutorial/Workshop 1 – Tutorials are delivered face-to-face on-campus. Tutorials consist of focus questions and group work.	2hrs	Week 1	7 times
Laboratory 1 – Laboratory work is conducted face-to-face on-campus. Each practical session is thematically linked to theoretical material covered in preceding weeks. Students are expected to work in teams during practical sessions.	3hrs	Week 3	6 times
Seminar – On campus seminar in Weeks 1, 5 & 12	1hr	Refer to Format	3 times

1.3. Course Topics

Atomic Theory, Elements, Law of Conservation of Mass, Symbols and Formulae, Measurement and Moles, Solutions and Molarity, Reactions, Acid-Base Equilibria, Atomic Structure and Electronic Configuration, Shapes of Molecules, Intermolecular Forces, Organic Chemistry, Thermochemistry

2. What level is this course?

100 Level (Introductory)

Engaging with discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Limited or no prerequisites. Normally, associated with the first 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	Demonstrate theoretical knowledge of chemical principles, structure, properties, processes and measurements.	Knowledgeable
2	Interpret and formulate chemical reactions and structures.	Creative and critical thinker Empowered
3	Solve mathematical problems using formulae, significant figures and units.	Knowledgeable Empowered
4	Compose a report based on practical work.	Knowledgeable Empowered

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

Not applicable

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

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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

Early and continuing feedback on your progress in the course is provided using each module's self-assessment questions. The mid-semester and final exams will be based very heavily on these self-assessment questions.

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	25%	60 minutes	Week 6	Online Test (Quiz)
All	2	Quiz/zes	Individual	15%	5-10 minutes each	Throughout teaching period (refer to Format)	Online Test (Quiz)
All	3	Report	Individual	20%	1000-2000 words or as equivalent. See Canvas for details.	Week 13	Online Assignment Submission with plagiarism check
All	4	Examination - Centrally Scheduled	Individual	40%	2 hours	Exam Period	Exam Venue

All - Assessment Task 1: Mid-Semester Exam

GOAL:	Apply your conceptual knowledge of chemical principles and use your problem-solving abilities.					
PRODUCT:	Examination - not Centrally Scheduled					
FORMAT:	60 minutes, mixed question type exam					
CRITERIA:	No.					Learning Outcome assessed
	1	Apply theoretical knowledge of chemical principles, structure, properties and units of measurement; interpret and evaluate chemical reactions.				1 2 3

All - Assessment Task 2: Laboratory Quizzes

GOAL:	Demonstrate your theoretical knowledge underpinning laboratory chemistry.					
PRODUCT:	Quiz/zes					
FORMAT:	Six (6) on-line quizzes (10 min. each) based on laboratory work (Weeks 3, 5, 7, 9, 11, 13).					
CRITERIA:	No.					Learning Outcome assessed
	1	Perform calculations and demonstrate knowledge of theories underpinning the laboratory work.				1 2 3

All - Assessment Task 3: Scientific Report

GOAL:	You use experimental data to develop a scientific report.					
PRODUCT:	Report					
FORMAT:	One report. Further guidance about what is required, is available in the assessment section of Canvas.					
CRITERIA:	No.					Learning Outcome assessed
	1	Observe, interpret, evaluate and report mathematical calculations and chemical reactions.				1 2 3 4

All - Assessment Task 4: Final examination

GOAL:	Demonstrate your theoretical knowledge of chemical principles gained throughout the semester.		
PRODUCT:	Examination - Centrally Scheduled		
FORMAT:	Multiple choice, short and extended answer exam based on materials from learning materials, tutorials and laboratory activities.		
CRITERIA:	No.		Learning Outcome assessed
	1	Solve problems using mathematical manipulations and calculations, and report answers to the correct significant figures with correct application of units.	1 3
	2	Apply theoretical knowledge of chemical principles, structure, properties, processes (physical, biological and environmental) and measurement	1 2
	3	Interpret and evaluate chemical reactions using knowledge of chemical reactivity, stoichiometry, equilibria and thermochemistry.	1 2

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.

7.1. Schedule

PERIOD AND TOPIC	ACTIVITIES
n/a	n/a

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	Paul Flowers et al	2019	Chemistry 2e NOTE: This textbook is licensed under a Creative Commons licence and is freely available on-line. Information about how to access the textbook is on Canvas in 'Getting started'	2nd edn	OpenStax, Chemistry. OpenStax CNX. 14 Feb 2019 http://cnx.org/contents/85abf193-2bd2-4908-8563-90b8a7ac8df6@9.524

8.2. Specific requirements

Attendance at the face-to-face laboratory sessions requires you to complete the laboratory induction process and bring your own safety glasses, lab coat and covered footwear.

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 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 (the rates are cumulative):

- 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](tel:0754301168) or using the [SafeZone](#) app. For general enquires contact the SafeUniSC team by phone [07 5456 3864](tel:0754563864) 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](tel:0754301226) 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