



CHEM11043 *Atoms, Molecules and Matter*

Term 1 - 2020

Profile information current as at 14/12/2025 06:34 am

All details in this unit profile for CHEM11043 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

Corrections

Unit Profile Correction added on 19-04-20

The end of term examination has now been changed to an alternate form of assessment. Please see your Moodle site for details of the assessment.

The Residential School for this unit has been postponed and you will need to complete this at a later date. Further details about the residential school will be made available on Moodle in due course.

General Information

Overview

Atoms, Molecules and Matter will provide you with an understanding of the basic principles of chemistry and how they apply to daily life. This unit will present fundamental chemical principles that are central to all sciences, including healthcare, biology, environmental science and agriculture. This unit will provide the foundation for further study in chemistry, biochemistry and molecular sciences. You will learn about matter and atomic structure, chemical bonding and the forces and chemical interactions between molecules. You will be introduced to the chemistry of electrolytes, acids, bases and buffers and enabled to perform calculations relating concentrations to the pH of strong and weak acids and bases and buffers. Understanding the naming and classification of chemical compounds will allow you to communicate effectively and precisely with your colleagues in science and industry. Basic nuclear radiation safety will be presented. On-campus students will attend regular laboratory sessions and there is a compulsory residential school for distance students. These laboratory sessions will emphasise laboratory safety and introduce you to skills relating to preparation of standard solutions and volumetric procedures, titrimetric and spectrophotometric analyses and scientific report writing.

Details

Career Level: *Undergraduate*

Unit Level: *Level 1*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Anti-requisite: CHEM11041

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 1 - 2020

- Mixed Mode
- Rockhampton

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Online Quiz(zes)**

Weighting: 30%

2. **Written Assessment**

Weighting: 20%

3. **Practical Assessment**

Weighting: Pass/Fail

4. **Examination**

Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Have your Say

Feedback

A number of students expressed their concern at the amount of content covered in this unit.

Recommendation

CHEM11043 is a pre-requisite to a number of units and in order to prepare the students for these units it is necessary to cover a lot of chemistry fundamentals. Staff can sympathise that students (particularly those studying chemistry for the first time) may feel overwhelmed and struggle with the unit content. Consequently, a large amount of resources were made available to students and students were made aware of the support facilities available to them such as the ALC and so forth. It appears that many students did not take advantage of the resources provided. The unit and its content have been continued reviewed since it's rebranding from CHEM11041. Consequently, the unit content has been updated, in fact, it should be noted that there was a reduction in the amount of content covered in CHEM11043 compared to previous offerings as certain topics were delivered in other units.

Feedback from Have your Say

Feedback

Some students queried if it was possible to have residential schools at other locations (rather than Rockhampton and Bundaberg)

Recommendation

Residential Schools are held where appropriate teaching spaces and laboratory space is available.

Feedback from Have your say Email Forums

Feedback

The majority of students indicated that overall they enjoyed the course, the following aspects were highlighted 1. Delivery of content 2. Approachability of staff and their consistent reliable response to queries 3. Quality of face to face interaction with staff 4. Use of online assessment pieces

Recommendation

It is very encouraging to hear students found the unit beneficial and enjoyable, as it is something the chemistry team as a whole have put quite a bit of effort into across all the units we are involved with.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Describe the structure of the atom including its sub-atomic particles and relate these to the design of the Periodic Table
2. Determine the nature of chemical bonding and intermolecular forces present in molecules and ions
3. Identify types of chemical reactions, and balance and interpret chemical equations
4. Perform chemical calculations relating to reaction equilibrium, yield and the pH of acids, bases and buffers
5. Identify functional groups and use the International Union of Pure and Applied Chemists (IUPAC) nomenclature to name organic molecules and indicate their potential chemical interactions
6. Outline the process of nuclear decay and discuss measures used to ensure safety when working with radiation
7. Work safely in the laboratory to prepare samples and standards and perform titrimetric and spectrophotometric analysis.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Online Quiz(zes) - 30%	•	•	•	•	•	•	
2 - Written Assessment - 20%			•	•			
3 - Practical Assessment - 0%							•
4 - Examination - 50%	•	•	•	•	•	•	

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes						
	1	2	3	4	5	6	7
1 - Communication				•			
2 - Problem Solving		•	•	•	•		•
3 - Critical Thinking			•	•		•	•
4 - Information Literacy		•	•				
5 - Team Work							•
6 - Information Technology Competence							
7 - Cross Cultural Competence							
8 - Ethical practice							
9 - Social Innovation							
10 - Aboriginal and Torres Strait Islander Cultures							

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
1 - Online Quiz(zes) - 30%		•	•	•		•				
2 - Written Assessment - 20%	•	•	•	•		•				
3 - Practical Assessment - 0%			•		•	•				
4 - Examination - 50%	•	•	•							

Textbooks and Resources

Textbooks

CHEM11043

Prescribed

CQUni Laboratory Notebook (A4 with Periodic Table)

Edition: 2019 (2019)

Authors: CQUniversity

CQUniversity

Rockhampton , Queensland , Australia

Binding: Spiral

CHEM11043

Supplementary

Chemistry (Paper Text + eBook code)

(2018)

Authors: Blackman , Bottle , Schmid , Mocerino & Wille

Wiley Australia

Milton , Queensland , Australia

ISBN: 9780730363286

Binding: Paperback

CHEM11043

Supplementary

Periodic Table of the Elements

Edition: 2019 (2019)

Authors: CQUniversity Bookshop

CQUniversity

Rockhampton , QLD , Australia

Binding: Other

Additional Textbook Information

A Study Guide will be made available online. However, you will need to purchase the Lab Notebook for class work. There is an optional text that will be useful for furthering your studies.

Copies can be purchased at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

[View textbooks at the CQUniversity Bookshop](#)

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

Referencing Style

All submissions for this unit must use the referencing style: [Vancouver](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Mani Naiker Unit Coordinator

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Schedule

Week 1 - 09 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Chemistry Matter Atoms Periodic Table	Chemistry Foundations Study Guide - Topics 1, 2 and 3	

Week 2 - 16 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Ions Formation Bonding Intermolecular Forces	Chemistry Foundations Study Guide - Topics 4, 5, 6 and 7	

Week 3 - 23 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
The Mole Mole-Mass Conversions Solutions and Dilutions	Chemistry Foundations Study Guide - Topics 8 and 9	Assessment Item 1 - Online Quiz 1 Quiz closes 11:55 pm (AEST), Sunday March 29, 2020

Week 4 - 30 Mar 2020

Module/Topic	Chapter	Events and Submissions/Topic
Chemical Equations 1	Chemistry Foundations Study Guide - Topics 10 and 11	

Week 5 - 06 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Chemical Equations 2	Chemistry Foundations Study Guide - Topics 11 and 12	

Vacation Week - 13 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Week 6 - 20 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Electrolytes Acids and Bases	Chemistry Foundations Study Guide - Topics 13 and 14	

Week 7 - 27 Apr 2020

Module/Topic	Chapter	Events and Submissions/Topic
Buffers Introduction to Nuclear Chemistry	Chemistry Foundations Study Guide - Topics 15 and 16	Assessment Item 2 - Written Assessment Due: 11:55 pm (AEST), Sunday May 3, 2020

Week 8 - 04 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to Organic Chemistry Saturated Hydrocarbons	Chemistry Foundations Study Guide - Topics 17 and 18	

Week 9 - 11 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Unsaturated Hydrocarbons Aromatics	Chemistry Foundations Study Guide - Topics 19 and 20	

Week 10 - 18 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Alcohols
Thiols
Amines

Chemistry Foundations Study Guide -
Topics 21, 22 and 23

Week 11 - 25 May 2020

Module/Topic	Chapter	Events and Submissions/Topic
Aldehydes and Ketones Carboxylic Acids and their Derivatives	Chemistry Foundations Study Guide - Topics 24 and 25	Laboratory Quiz 1 - Online Quiz closes 11:55pm (AEST), Sunday 31 May, 2020 Laboratory Quiz 2 - Online Quiz closes 11:55pm (AEST), Sunday 31 May, 2020

Week 12 - 01 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
Review		Assessment Item 1 - Online Quiz 2 Quiz closes 11:55 pm (AEST), Sunday June 7, 2020

Review/Exam Week - 08 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Exam Week - 15 Jun 2020

Module/Topic	Chapter	Events and Submissions/Topic
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Term Specific Information

A Study Guide for this unit will be provided via the Moodle site. This Study Guide will be your reference material for this unit. Please refer to the Textbooks and Resources section of this unit profile for additional textbook requirements.

Internal weekly laboratory sessions will only be offered at the Rockhampton North Campus - All other students will be required to attend one (only) of the scheduled residential schools.

Assessment Tasks

1 Online Quiz

Assessment Type

Online Quiz(zes)

Task Description

This assessment is comprised of 2 online quizzes which will assess your understanding of the topics presented in this unit. This assessment requires you to apply the concepts presented in lectures to answer a series of multiple choice questions. All questions in each quiz are of equal value.

Quiz 1 will contribute 10%

Quiz 2 will contribute 20%.

The two online quizzes will contribute a total of 30% of the assessment for this unit. The quizzes are not timed and you are allowed two attempts; the highest score of the two attempts will be recorded. Note that quiz questions are generated randomly and you will receive different questions on subsequent attempts.

Number of Quizzes

2

Frequency of Quizzes

Other

Assessment Due Date

Online Quiz 1 be due at 11:55 pm (AEST) on the Sunday of Week 3 (March 29, 2020) and Online Quiz 2 be due at 11:55 pm (AEST) on the Sunday of Week 12 ((June 7, 2020).

Return Date to Students

Quizzes will be released after the completion of each attempt. Answers to the quiz questions will be released after each quiz has closed.

Weighting

30%

Assessment Criteria

All questions are of equal weighting. One mark will be awarded for each correct response. Incorrect responses will not incur a penalty.

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

Complete each quiz by following the link on the CHEM11043 Moodle site.

Learning Outcomes Assessed

- Describe the structure of the atom including its sub-atomic particles and relate these to the design of the Periodic Table
- Determine the nature of chemical bonding and intermolecular forces present in molecules and ions
- Identify types of chemical reactions, and balance and interpret chemical equations
- Perform chemical calculations relating to reaction equilibrium, yield and the pH of acids, bases and buffers
- Identify functional groups and use the International Union of Pure and Applied Chemists (IUPAC) nomenclature to name organic molecules and indicate their potential chemical interactions
- Outline the process of nuclear decay and discuss measures used to ensure safety when working with radiation

Graduate Attributes

- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

2 Written Assessment

Assessment Type

Written Assessment

Task Description

This assessment is designed to assess your comprehension of the concepts presented in the unit through their application to answer a series of questions.

Marks will be awarded for each question as indicated in the assessment item (please see the Moodle site for further details).

Explanations for each answer must be provided and if calculations are required all workings must be provided.

Assessment Due Date

The assessment is due at 11:55 pm (AEST) on the Sunday of Week 7 (May 3, 2020)

Return Date to Students

Week 10 Friday (22 May 2020)

Weighting

20%

Assessment Criteria

Marks will be awarded for each question as indicated in the assessment item (please see the Moodle site for further details).

Referencing Style

- [Vancouver](#)

Submission

Online

Submission Instructions

Upload assessment in WORD FORMAT by following the instructions on the Moodle site for CHEM11043

Learning Outcomes Assessed

- Identify types of chemical reactions, and balance and interpret chemical equations
- Perform chemical calculations relating to reaction equilibrium, yield and the pH of acids, bases and buffers

Graduate Attributes

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Information Technology Competence

3 Practical Assessment

Assessment Type

Practical Assessment

Task Description

The practical component of CHEM11043 has been designed to provide and scaffold essential laboratory skills for chemistry for 2nd and 3rd year chemistry units and the workplace. The practical sessions will be undertaken in 2 blocks. Each block has been designed to allow you to develop excellence in laboratory practices and provide a solid foundation for future laboratory work.

The first block will focus on UV visible spectroscopy and will develop skills in the following:

- Working safely in the laboratory
- Correctly using top pan and analytical balances
- Sample preparation including quantitative transfers
- Correctly using pipettes and volumetric flasks
- Preparing dilution series for spectroscopic analysis
- Using a spectrophotometer
- Manual and Excel graphing techniques with consideration of interpolation and extrapolation
- Performing relevant calculations to process data from spectroscopic analysis
- Maintaining data records.

The second block will focus on titration and will develop skills in the following:

- Working safely in the laboratory
- Correctly using a burette
- Calibrating a pH meter
- Choosing an appropriate indicator for a neutralisation reaction titration
- Conducting titrations with good technique and accuracy
- Performing relevant calculations to process titration data
- Maintaining data records

The laboratory component of CHEM11043 is assessed by

- use of laboratory notebook to show records of laboratory data, calculations and discussion questions
- two online practical theory quizzes
- competency in laboratory skills
- two practical tests

As the practical component is a Pass/Fail grade it is essential that you pass all aspects of the assessment.

Assessment Due Date

The laboratory component will be completed during term as per schedules for on campus and Mixed Mode students. The online laboratory quizzes must be submitted by the 11.55 PM (AEST) on the Sunday at the end of week 11.

Return Date to Students

Feedback on laboratory competencies will be given throughout the term during the laboratory sessions. Quiz results will be released after the completion of each attempt. Answers to the quiz questions will be released after the quiz has

closed. A Pass/Fail grade will be recorded for this assessment following completion of the Residential School or weekly laboratory sessions and the online quizzes.

Weighting

Pass/Fail

Minimum mark or grade

90% on the Online quizzes. All other components are Pass/Fail. It is a requirement to achieve a Pass grade for the Practical Assessment in order to be eligible to pass CHEM11043.

Assessment Criteria

Mixed mode students are required to attend and participate in all laboratory exercises scheduled for a four day residential school.

Internal students are required to attend and participate in all scheduled laboratory sessions as per the laboratory schedule available on the Moodle site.

Specific assessment criteria for components of this task are:

1. Laboratory notebook must show records of laboratory data, calculations and completion of discussion questions. Notebooks will be inspected randomly throughout the term.
2. Two online practical theory tests must be completed. The quizzes will relate to associated theory and techniques used in the two blocks of practicals (spectrophotometric and titration focused). You will have unlimited attempts at each quiz, but you are required to achieve 90% minimum to pass.
3. Competency in specified laboratory skills must be demonstrated. Competency in the correct use of burettes, volumetric flasks, pipettes, balances and pH meters will be assessed during the laboratory sessions.
4. Completion of two practical tests where you will be required to conduct experiments to demonstrate your competency in spectrophotometric and titrimetric analyses. To be awarded a Pass grade for each practical test, your results must be within a given range of the actual results. Should your result be outside of this range, you will be required to show cause or provide evidence from previous sessions that you are competent in the skills being assessed.

Referencing Style

- [Vancouver](#)

Submission

No submission method provided.

Submission Instructions

Rockhampton Internal students must attend all laboratory sessions held throughout the term. Mixed mode students must select to attend only one of the available 4 day Residential schools offered. Your selection can be made through the student allocator / timetable system on MyCQU. Each of the 2 quizzes must be completed online. All other laboratory skills assessment will be completed and assessed during the laboratory sessions.

Learning Outcomes Assessed

- Work safely in the laboratory to prepare samples and standards and perform titrimetric and spectrophotometric analysis.

Graduate Attributes

- Critical Thinking
- Team Work
- Information Technology Competence

Examination

Outline

Complete an invigilated examination.

Date

During the examination period at a CQUniversity examination centre.

Weighting

50%

Length

120 minutes

Minimum mark or grade

40%

Exam Conditions

Closed Book.

Materials

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).

Calculator - all non-communicable calculators, including scientific, programmable and graphics calculators are authorised

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

**Be Honest**

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

**Seek Help**

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

**Produce Original Work**

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem