



# CHEM11042 *Fundamentals of Chemistry*

## Term 3 - 2018

Profile information current as at 01/05/2024 11:08 am

All details in this unit profile for CHEM11042 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.

## General Information

### Overview

This unit will provide you with the fundamental principles of chemistry that underpin the medical sciences and provide a strong foundation on which you can develop an understanding of biochemistry and molecular science. You will gain an appreciation of the nature of matter, classic atomic structure and how energy is involved in bond formation. These concepts will be developed to explain the forces between molecules that govern chemical interaction. You will be introduced to the chemistry of electrolytes, acids, bases and buffers. This study will be supported by simple calculations to assist you in relating to the pH scale. The study of organic chemistry and molecules central to the life sciences will enable you to develop an understanding of the biochemistry and molecular biology relevant to your specific discipline. The naming and classifying of chemical compounds will enable you to be conversant with accepted scientific terms. Tutorials and on-line activities will complement the theoretical knowledge gained in lectures and provide you with the basic mathematical and analytical tools required in the application of chemistry to your specific discipline.

### 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

There are no requisites for this unit.

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 3 - 2018

- Distance

### 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. **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 survey, Moodle forums and student- staff discussions

##### **Feedback**

Some students were displeased with the quality of the lecture videos, a number highlighting echo 360 in particular as an issue (sound issues). This unfortunately appears to be a common complaint across a number of units.

##### **Recommendation**

Measures were taken by academic staff to improve video quality with reasonable success (personal purchase of microphone). Issues with echo 360 however, are beyond the academic staff's control. It should be noted that the University has moved to an updated Echo 360 platform for term 2 2018 so hopefully this will combat a lot of the issues highlighted.

#### Feedback from Have your say survey, Moodle forums and student- staff discussions

##### **Feedback**

Students highlighted the occurrence of a sesskey error in Moodle which made navigation of the Moodle site difficult and time consuming.

##### **Recommendation**

Academic staff were in contact with ITD to remedy the issue - this is an ongoing issue that ITD are aware of and are working to resolve. Again, this unfortunately is somewhat beyond the control of academic staff.

#### Feedback from Have your say survey, Moodle forums and student- staff discussions

##### **Feedback**

A number of students expressed their concern at the amount of content covered in this unit. With some querying the relevance of the content for their discipline and future study. Some felt that their understanding would benefit if the unit was divided into more units - either via the addition of a bridging unit prior to CHEM11042 to cover the unit load or by the delivery of the content over two separate units.

##### **Recommendation**

CHEM11042 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.

#### Feedback from Have your say survey, Moodle forums and student- staff discussions

##### **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**

Continue best practice.

## Unit Learning Outcomes

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

1. Apply concepts of atomic structure to explain molecular bonding and nuclear reactivity.
2. Apply chemical concepts to healthcare situations.
3. Identify categories of organic compounds and their potential chemical interactions.
4. Perform basic chemical calculations.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

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

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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%	•	•	•	•		•				

Assessment Tasks	Graduate Attributes									
	1	2	3	4	5	6	7	8	9	10
<b>3 - Examination - 50%</b>	•	•	•	•						

## Textbooks and Resources

### Textbooks

CHEM11042

#### Prescribed

#### Chemistry: Core Concepts

Edition: 1st edn (2016)

Authors: Blackman et al

John Wiley and Sons

Milton, Queensland, Australia

Binding: eBook

#### Additional Textbook Information

You are required to purchase an E-Text, which can be purchased by accessing the link on the CHEM11042 Moodle site. The E-book provides animations and short lecture style videos to assist you in your learning and the Wiley Plus Learning Space provides additional quizzes to further reinforce the course material and to assist you to gauge your understanding of the concepts presented.

However, if you prefer a paper copy, they are still available at the CQUni Bookshop here: <http://bookshop.cqu.edu.au> (search on the Unit code)

In addition to the textbook, students are required to have a Scientific calculator (preferred brand Casio FX82 ES) and Periodic table (optional), which are also available at the CQUni Bookshop - see link above.

[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 styles below:**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Vancouver](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Aoife Power** Unit Coordinator

[a.power@cqu.edu.au](mailto:a.power@cqu.edu.au)

## Schedule

**Week 1 - 12 Nov 2018**

Module/Topic	Chapter	Events and Submissions/Topic
L1: How this unit will run L2: Introduction to matter L3: Measurement	1.1 Why study chemistry? 1.2 Introduction to matter 3.3 Measurement	All weekly quizzes must be completed by the Wednesday of the following week, i.e. week 1's quiz should be completed by the Wednesday of week 2

### Week 2 - 19 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Atomic structure L2: Periodic Table and ion formation L3: Scientific notation and the metric system	1.4 The structure of the atom 1.5 The Periodic Table 3.1 Section: Expression of large and small numbers 3.1 Section: Exponents and logarithms 3.2 Section: SI Units	Quiz 1 closes 11.55pm, Wednesday 14th November 2018

### Week 3 - 26 Nov 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Molecular formula and the mole L2: Lewis dot diagrams L3: Ionic bonding	2.1 Representations in chemistry 4.4 The mole 6.1 Fundamentals of bonding 6.2 Ionic bonding	Quiz 2 closes 11.55pm, Wednesday 21st November 2018

### Vacation Week - 03 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic

### Week 4 - 10 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Covalent Bonding and Lewis dot diagrams L2: VSEPR L3: Intermolecular forces	6.3 Lewis structures 6.4 VSEPR 7.2 Intermolecular forces	Quiz 3 closes 11.55pm, Wednesday 28th November 2018

### Week 5 - 17 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Solutions and concentration L2: Molarity and stoichiometry L3: Dilutions	10.1 Solutions and solubility 10.2 Section: Concentration of solutions 10.2 Section: Diluting a solution	Quiz 4 closes 11.55pm, Wednesday 12th December 2018

### Week 6 - 31 Dec 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Chemical reactions L2: Energy in reactions L3: Equilibrium	4.1 Chemical and physical change 4.2 Chemical equations 4.3 Balancing chemical equations 4.6 Stoichiometry, limiting reagents and percentage yield 8.3 Enthalpy 13.4 Temperature dependence of chemical reactions 13.5 Reaction mechanism and catalysis 9.1 Chemical equilibria 9.2 The equilibrium constant, and the reaction quotient 9.4 How systems at equilibrium respond to change	Quiz 5 closes 11.55pm, Wednesday 19th December 2018

### Week 7 - 07 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic

L1: Acid bases and neutralisation reactions L2: pH calculations L3: Buffers	11.1 The Bronsted-Lowry definition 11.5 The molecular basis of acid strength 11.2 Acid-base reactions in water 11.6 Buffer solutions	Quiz 6 closes 11.55pm, Wednesday 2nd January 2019
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### Week 8 - 14 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
L1: The Ideal Gas equation L2: Dalton's Law and Henry's Law L3: Nuclear chemistry	7.3 Gases 7.4 Gas mixtures Supplementary material	Quiz 7 closes 11.55pm, Wednesday 9th January 2019 Poster: Applications of chemistry to Paramedic/Chiropractic scenarios. Due: Week 8 Friday (11th January 2019) 11:55 pm AEST  <b>Poster: Applications of Chemistry to Paramedic or Chiropractic Scenarios</b> Due: Week 8 Friday (18 Jan 2019) 11:55 pm AEST

### Week 9 - 21 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
L1: Introduction to organic chemistry and alkanes L2: Alkenes and alkynes L3: Aromatic compounds	2.1 Representations in chemistry 2.2 Section: Naming organic compounds - alkanes 14.1 Introduction to hydrocarbons 14.2 Alkanes 14.4 Reactions of alkanes 14.3 Alkenes and alkynes 14.5 Reactions of alkenes 14.6 Aromatic compounds	Quiz 8 closes 11.55pm, Wednesday 16th January 2019

### Week 10 - 28 Jan 2019

Module/Topic	Chapter	Events and Submissions/Topic
L1: Functional groups, aldehydes, ketones and ethers L2: Alcohols L3: Oxidation of alcohols	2.2 Section: Naming organic compounds - functional groups 15.2 Alcohols 15.3 Reactions of alcohols	Quiz 9 closes 11.55pm, Wednesday 23rd January 2019

### Week 11 - 04 Feb 2019

Module/Topic	Chapter	Events and Submissions/Topic
L1: Amines L2: Carboxylic acids and derivatives L3: Chiral compounds	15.4 Amines 15.6 Carboxylic acids 15.7 Nomenclature of carboxylic acids and derivatives 15.1 Chiral compounds	Quiz 10 closes 11.55pm, Wednesday 30th January 2019

### Week 12 - 11 Feb 2019

Module/Topic	Chapter	Events and Submissions/Topic
Review		

### Exam Week - 11 Feb 2019

Module/Topic	Chapter	Events and Submissions/Topic
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## Assessment Tasks

### 1 Weekly on-line quizzes

#### Assessment Type

Online Quiz(zes)

**Task Description**

This assessment is comprised of ten on-line quizzes (for Weeks 1 to 10). Completing these quizzes will give you an indication of your understanding of the concepts presented each week and encourage you to stay on track with your study. This assessment requires you to apply the concepts to answer a series of multiple choice questions. Each quiz is comprised of 10 multiple-choice questions selected from a question bank. All questions in each quiz are of equal value and each of the 10 quizzes will contribute 3%, totaling 30% for this assessment item. The quiz is not timed and you are allowed three attempts; the highest score of the three attempts will be recorded. Note that questions are generated randomly and you will receive different questions on subsequent attempts. There is a minimum mark requirement of 40% for this assessment item, i.e., you must attain 40% in total for the 10 quizzes in order to pass the unit overall.

**Number of Quizzes**

10

**Frequency of Quizzes**

Weekly

**Assessment Due Date**

Each quiz will close at 11:55pm on the Wednesday of the following week. i.e. The week 1 quiz will close on the Wednesday of week 2.

**Return Date to Students**

Quiz results will be released after the completion of each attempt. Answers will be released after the quiz has closed.

**Weighting**

30%

**Minimum mark or grade**

40% of total marks available for the 10 quizzes

**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**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Vancouver](#)

**Submission**

Online

**Submission Instructions**

Complete each week's quiz by following the link on the Moodle site.

**Learning Outcomes Assessed**

- Apply concepts of atomic structure to explain molecular bonding and nuclear reactivity.
- Identify categories of organic compounds and their potential chemical interactions.
- Perform basic chemical calculations.

**Graduate Attributes**

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

## 2 Poster: Applications of Chemistry to Paramedic or Chiropractic Scenarios

**Assessment Type**

Written Assessment

**Task Description**

This assessment requires you to design a professional poster that clearly illustrates the importance of chemistry in a scenario or medical condition that is significant to healthcare, particularly in your chosen field of paramedic or chiropractic science. The poster should be well presented and include an image or diagram that represents and highlights the significance of the scenario chosen.

You are to use your chemical knowledge and conduct research to explain the scenario and also suggest ways of



improving, treating or preventing the issue being discussed.

The poster should be designed using PowerPoint application. A template for the poster and a 'how-to' video will be made available on the Moodle site. Further task details and a list of potential topics will also be available on the units Moodle site.

**Assessment Due Date**

Week 8 Friday (18 Jan 2019) 11:55 pm AEST

**Return Date to Students****Weighting**

20%

**Minimum mark or grade**

40%

**Assessment Criteria**

A marking Rubric will be provided on the Moodle site for this unit. Marks will be awarded for:

1. Introduction to the topic
2. The use of an appropriate image
3. The chemical explanation of the topic
4. Discussion on the potential of chemical knowledge to help explain/solve the problem presented
5. Overall presentation
6. Grammar and spelling
7. Referencing

**Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)
- [Vancouver](#)

**Submission**

Online

**Submission Instructions**

Submit your poster as a single .pdf file

**Learning Outcomes Assessed**

- Apply chemical concepts to healthcare situations.

**Graduate Attributes**

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