



# CHEM11042 *Fundamentals of Chemistry*

## Term 3 - 2017

Profile information current as at 14/05/2024 04:53 pm

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 - 2017

- 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 Moodle forums and student- staff discussions

**Feedback**

The twice daily response to the Q&A forum was appreciated by students

**Recommendation**

Continue good practice with twice daily sessions to answer any questions on the Q&A forum. Students will be encouraged to read other posts on this forum.

## Feedback from Moodle forums and student-staff discussions

**Feedback**

Generally students found the structure of this Unit very workable. The students appreciated the regular format for each week with included: lecture scenario and focus notes for the week, lecture slides and videos incorporating use of the document camera for 'ease of following', reading and tutorial question list along with worked solutions and videos of same. Students appreciated the availability of lectures well ahead of time as this enabled them to plan studies around work commitments.

**Recommendation**

Continue good practice and ensure frequent use of document camera for all recordings by all teaching staff so as to show live workings for calculations and explanations.

## Feedback from Moodle forums and student-staff discussions

**Feedback**

Students enjoyed the scenario based approach for the introduction of topics for this Unit. This approach was also extended to the Poster assessment item which was well received.

**Recommendation**

The scenario based approach to this Unit will continue and further scenarios will be introduced.

## Feedback from Moodle forums and student-staff discussions

**Feedback**

More face to face tutorials for all students

**Recommendation**

The face to face tutorials for the Rockhampton campus will remain. In addition, an investigation into the possibility of a non-compulsory workshop for Flex students to attend Rockhampton campus will be undertaken. The possibility of frequent zoom sessions will also be considered, although large cohort numbers may make these session difficult.

## Feedback from Moodle forums

**Feedback**

Some students did not like the prescribed online text,

**Recommendation**

Students were recommended to purchase a preferred option of the online text however this was not always taken. A hard copy text was also available. Future offerings should highlight to students that the hard copy is available.

## Feedback from Moodle forums and student-staff discussions

**Feedback**

Some students made comment that there was too much content in this Unit or the Maths was too difficult.

**Recommendation**

Students will be encouraged to contact the ALC early in the term if they feel that their basic maths skills are not of appropriate standards. Required skills are multiplication, division, and basic algebra including rearranging equations. The unit content can be broken down to 3 broad topics and this will be highlighted to students early on in the term. The topics introduced have been reduced both in quantity and depth from previous offerings with a focus now on relevance and application to paramedic/chiropractic scenarios.

## 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

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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### 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

**There are no required textbooks.**

#### Additional Textbook Information

You are required to purchase an E-Text:

***Blackman et al, Chemistry Core Concepts, 1<sup>st</sup> edition, 2016 with Wiley Plus Learning Space.***

This item 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.

In addition to the E- textbook, students are required to have a Scientific calculator (preferred brand Casio FX82 ES) and Periodic table (optional)

### 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 \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Delma Clifton** Unit Coordinator

[d.clifton@cqu.edu.au](mailto:d.clifton@cqu.edu.au)

## Schedule

### Week 1 - 06 Nov 2017

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 Quizzes open 6/11/17

### Week 2 - 13 Nov 2017

Module/Topic	Chapter	Events and Submissions/Topic
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L1: Atomic structure L2: Periodic Table; ion formation L3: Scientific notation; 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, Sunday 19/11/17
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### Week 3 - 20 Nov 2017

Module/Topic	Chapter	Events and Submissions/Topic
L1: Molecular formula; moles 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, Sunday 26/11/17

### Week 4 - 27 Nov 2017

Module/Topic	Chapter	Events and Submissions/Topic
L1: Covalent Bonding; Lewis dot diagrams L2: VSEPR L3: Intermolecular forces	6.3 Lewis structures 6.4 VSEPR 7.2 Intermolecular forces	Quiz 3 closes 11.55pm, Sunday 3/12/17

### Vacation Week - 04 Dec 2017

Module/Topic	Chapter	Events and Submissions/Topic
Revision		

### Week 5 - 11 Dec 2017

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, Sunday 17/12/17

### Week 6 - 18 Dec 2017

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, Sunday 24/12/17

### Week 7 - 01 Jan 2018

Module/Topic	Chapter	Events and Submissions/Topic
L1: Acid bases; 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, Sunday 7/01/17

### Week 8 - 08 Jan 2018

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, Sunday 14/01/17 <b>Poster: Applications of Chemistry to Paramedic or Chiropractic Scenarios</b> Due: Week 8 Friday (12 Jan 2018) 11:55 am AEST

### Week 9 - 15 Jan 2018

Module/Topic	Chapter	Events and Submissions/Topic
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L1: Introduction to organic chemistry; 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, Sunday 21/01/17
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#### Week 10 - 22 Jan 2018

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, Sunday 28/01/17

#### Week 11 - 29 Jan 2018

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, Sunday 4/02/17

#### Week 12 - 05 Feb 2018

Module/Topic	Chapter	Events and Submissions/Topic
Review		

#### Review/Exam Week - 12 Feb 2018

Module/Topic	Chapter	Events and Submissions/Topic
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#### Exam Week - 12 Feb 2018

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

In order to pass this unit, students must attain at least 50% overall and meet the minimum mark specified for each assessment.

## 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. You may not make a second attempt on any quiz for 12 hours, allowing time to go back over the content. Therefore, if you wish to take advantage of the three attempts, you must start before the final day it is open. 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. In the absence of an approved extension, there will be no late submissions allowed for this assessment item.

#### Number of Quizzes

10

**Frequency of Quizzes**

Weekly

**Assessment Due Date**

Each quiz will close at 11:55pm on the Sunday of the following week. i.e. The week 1 quiz will close on the Sunday 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 \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

**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 to clearly illustrate the importance of chemistry in a scenario or medical condition that is significant to healthcare and has particular relevance to your discipline.

Please choose a topic for your poster from the following list. The number in brackets indicates the week's work that covers material relevant to the topic. If you wish to present different topics you must contact the lecturers for approval before the Friday of week 5.

- Preparation of ice baths (1)
- Synovial fluid within joints (1)
- Use of isotopes for medical treatment (2)
- Dehydration and electrolyte substitutes (2)
- Osteoporosis and its treatment (3, 4)
- Molecular shape affects drug activity (3, 4)
- Carbon monoxide poisoning (6)
- Lactose intolerance and enzymes (6)
- Bee stings and ant bites (7)
- Antacid tablets (7)
- Autoclaving (8)
- Breathing and asthmatics (8)

You are to use your chemical knowledge to explain the scenario and suggest ways of improving, treating, preventing or



explaining the issue being discussed.

The poster should be designed using PowerPoint or a program of your choice, be well presented, and include an image or diagram that represents and highlights the significance of the scenario or condition chosen. Extra support, including a template for the poster, a 'how-to' video, and a marking rubric, will be available on the Moodle site.

The completed poster should be saved in PDF format and uploaded to the Moodle site.

**Assessment Due Date**

Week 8 Friday (12 Jan 2018) 11:55 am AEST

**Return Date to Students**

Week 11 Friday (2 Feb 2018)

**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 \(APA 6th edition\)](#)
- [Harvard \(author-date\)](#)

**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 - non-programmable, no text retrieval, silent only

## 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