



# CHEM12080 Organic Chemistry

## Term 1 - 2021

Profile information current as at 02/05/2024 10:43 am

All details in this unit profile for CHEM12080 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 build on the organic chemistry aspects learnt in CHEM11044. In this unit, you will learn theoretical and practical chemistry applications in organic chemistry. You will become familiar with laboratory compliance procedures, interpret risks and appropriate risk-minimisation approaches. The theoretical concepts will include an overview of organic reactions, structural determinations using spectroscopy, benzene chemistry, carbonyl substitution and condensation reactions, amine and heterocyclic chemistry, and pericyclic reactions. Contents covered in this unit will provide a sturdy basis for studies in bio-organic chemistry, analytical and materials sciences, physical and interface chemistry. Contents covered in this unit will also allow you to be able to understand the implications of advanced organic chemistry associated with manufacturing, environment and medical fields. Accompanying the theory, you will enhance your practical skills by learning the operation and maintenance of common instrumentation used for chemical analysis, perform advanced wet chemical analysis, organic synthesis, isolation, purification and structural elucidation of organic products.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Pre-requisite: CHEM11044 Chemical Reactions.

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 - 2021

- Mixed Mode

### 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).

### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

### 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. **Written Assessment**

Weighting: 20%

#### 2. **Practical Assessment**

Weighting: 30%

#### 3. **Take Home Exam**

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](#).

## Unit Learning Outcomes

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

1. Apply concepts of chemical reaction mechanisms towards describing organic reactions
2. Apply theories of nuclear magnetic resonance, infrared, ultraviolet and mass spectroscopy to determine structures of organic compounds
3. Analyse organic reactions involving compounds containing a range of functional groups
4. Demonstrate skills in manipulation of laboratory apparatus, careful and systematic observation, precise recording and communication of experimental data.

The Applied Chemistry content of CU18 is in the process of applying for accreditation in 2021. As part of the content mapping against accreditation benchmarks, the learning outcomes of all units in the course have been mapped against the Learning Outcomes (LO) of the Royal Australian Chemical Institute (accrediting body). In the mapping exercise, concepts in structure determination (LO 2.1.2) and chemical synthesis (LO 3.3.2) were found to be absent in the CU18 course. These concepts are included in this unit.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 20%			•	
2 - Practical Assessment - 30%	•	•		•
3 - Take Home Exam - 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				

Graduate Attributes	Learning Outcomes			
	1	2	3	4
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 - Written Assessment - 20%	•	•	•	•		•				
2 - Practical Assessment - 30%	•	•	•	•	•	•		•		
3 - Take Home Exam - 50%	•	•	•			•				

## Textbooks and Resources

### Textbooks

CHEM12080

#### Prescribed

#### Organic Chemistry

Edition: 9th (2014)

Authors: John E. McMurry

Brooks/Cole (Cengage Learning)

Pacific Grove, CA, USA

ISBN: 9781305080485

Binding: Hardcover

#### Additional Textbook Information

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  
[m.naiker@cqu.edu.au](mailto:m.naiker@cqu.edu.au)

## Schedule

### Week 1 - 08 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Overview of Organic Reactions	6	

### Week 2 - 15 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Structure Determination: Mass Spectrometry and Infrared Spectroscopy	12	

### Week 3 - 22 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Structure Determination: Nuclear Magnetic Resonance Spectroscopy	13	

### Week 4 - 29 Mar 2021

Module/Topic	Chapter	Events and Submissions/Topic
Conjugated Dienes and Ultraviolet Spectroscopy	14	

### Week 5 - 05 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Benzene and Aromaticity	15	

### Vacation Week - 12 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Self-review Tasks Due:</b> Vacation Week Friday (16 April 2021) 11:45 pm AEST

### Week 6 - 19 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Chemistry of Benzene	16	

### Week 7 - 26 Apr 2021

Module/Topic	Chapter	Events and Submissions/Topic
Carbonyl $\alpha$ -Substitution Reactions	22	

### Week 8 - 03 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Carbonyl Condensation Reactions	23	<b>Written Assessment Due:</b> Week 8 Friday (7 May 2021) 11:45 pm AEST

### Week 9 - 10 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Amines and Heterocycles	24	

### Week 10 - 17 May 2021

Module/Topic	Chapter	Events and Submissions/Topic

Orbitals and Organic Chemistry: 30  
Pericyclic Reactions

### Week 11 - 24 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review		<b>Practical Assessment</b> Due: Week 11 Friday (28 May 2021) 11:45 pm AEST

### Week 12 - 31 May 2021

Module/Topic	Chapter	Events and Submissions/Topic
Review		

## Term Specific Information

All the lectures and tutorials will be recorded and posted online.

**ALL STUDENTS will be required to attend a three-day compulsory residential school at Rockhampton in week 6.**

## Assessment Tasks

### 1 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

Week 8 Friday (7 May 2021) 11:45 pm AEST  
To be submitted via Moodle as a word document

#### Return Date to Students

Week 11 Monday (24 May 2021)  
Via assessment task feedback file in Moodle

#### Weighting

20%

#### Minimum mark or grade

50%

#### 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

To be submitted via Moodle as a word document by following the instructions on the Moodle site. It is your responsibility to make sure that the submission is done by the due date.

#### Learning Outcomes Assessed

- Analyse organic reactions involving compounds containing a range of functional groups

## Graduate Attributes

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

## 2 Practical Assessment

### Assessment Type

Practical Assessment

### Task Description

Prior to attending the residential school, you will be required to complete the self-review tasks by 16 April 2021 and emailed (m.naiker@cqu.edu.au) to the coordinator as a word document. More information on this will be provided in the Moodle page.

During the residential school you will be undertaking a range of chemical analysis and qualitative measurements to characterise various constituents in a natural matrix. At the end of the residential school, you will be required to submit an individual final report outlining the following:

- Title
- Introduction
- Objectives
- Results (tables, graphs etc.)
- Discussion
- Conclusions
- References

Your complete final report pertaining to all tasks undertaken during the residential school should be of no more than 2000 words. Include in-text references for all literature cited and a complete reference list at the end. The text must be word processed and submitted as a word document via Moodle. It is your responsibility to make sure that the submission is done by the due date.

The final report is compulsory and should be submitted collated into one file. For this assessment if you do not meet the minimum pass mark, you may not be eligible for a supplementary exam or assessment.

### Assessment Due Date

Week 11 Friday (28 May 2021) 11:45 pm AEST

To be submitted via Moodle as a word document.

### Return Date to Students

Review/Exam Week Monday (7 June 2021)

Via assessment task feedback file in Moodle

### Weighting

30%

### Minimum mark or grade

50%

### Assessment Criteria

Refer to the marking rubric sheet that will be made available on Moodle

### Referencing Style

- [Vancouver](#)

### Submission

Online

### Submission Instructions

To be submitted via Moodle as a word document. It is your responsibility to make sure that the submission is done by the due date

### Learning Outcomes Assessed

- Apply concepts of chemical reaction mechanisms towards describing organic reactions

- Apply theories of nuclear magnetic resonance, infrared, ultraviolet and mass spectroscopy to determine structures of organic compounds
- Demonstrate skills in manipulation of laboratory apparatus, careful and systematic observation, precise recording and communication of experimental data.

#### **Graduate Attributes**

- Communication
- Problem Solving
- Critical Thinking
- Information Literacy
- Team Work
- Information Technology Competence
- Ethical practice

### **3 Take Home Exam**

#### **Assessment Type**

Take Home Exam

#### **Task Description**

The take home exam will cover all the content you have studied this term. This assessment will be in the form of a written assessment that will be made available via Moodle during exam week. You will be allowed 48 hours to complete and upload this take-home exam via Moodle as a word document.

In completing this assessment, you should note the following:

- Attempt all questions
- All submissions should be typed and saved as a word document
- Show all calculations as required
- Completed assessment is to be submitted via upload on Moodle page.

The breakdown of topics to be covered in the take home exam and associated marks will be made available on Moodle

#### **Assessment Due Date**

The take-home exam will be available for download on a specific day during the university's standard exam period. More details on the due date and time will be provided later via Moodle. This exam it will be available for 48 hours ONLY and should be submitted via upload to Moodle NO LATER than 48 hours after it is made available.

#### **Return Date to Students**

Marks will be returned 7-14 days after the take-home exam is submitted via Gradebook in Moodle.

#### **Weighting**

50%

#### **Minimum mark or grade**

50%

#### **Assessment Criteria**

The assessment marking criteria will be based on the marks allocated for each question in the take home exam

#### **Referencing Style**

- [Vancouver](#)

#### **Submission**

Online

#### **Submission Instructions**

Word processed (that are scanned into an electronic format within the timeframe of the assessment) are acceptable formats for submission. Completed assessment is to be submitted via upload on Moodle page.

#### **Learning Outcomes Assessed**

- Apply concepts of chemical reaction mechanisms towards describing organic reactions
- Apply theories of nuclear magnetic resonance, infrared, ultraviolet and mass spectroscopy to determine structures of organic compounds
- Analyse organic reactions involving compounds containing a range of functional groups

#### **Graduate Attributes**

- Communication



- Problem Solving
- Critical Thinking
- Information Technology Competence

## 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