



# CHEM1002

## Foundations of Chemical and Biomolecular Sciences 2

Session 2, Weekday attendance, North Ryde 2020

*Department of Molecular Sciences*

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#### Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

#### Notice

As part of [Phase 3 of our return to campus plan](#), most units will now run tutorials, seminars and other small group learning activities on campus for the second half-year, while keeping an online version available for those students unable to return or those who choose to continue their studies online.

To check the availability of face-to-face and online activities for your unit, please go to [timetable viewer](#). To check detailed information on unit assessments visit your unit's iLearn space or consult your unit convenor.

## General Information

Unit convenor and teaching staff

Robert Willows

[robert.willows@mq.edu.au](mailto:robert.willows@mq.edu.au)

Credit points

10

Prerequisites

CHEM1001 or CBMS107 or CBMS103 or HSC Chemistry Band 5 and above

Corequisites

Co-badged status

Unit description

Molecular sciences is the basis for the development of new medicines, new materials, new ways of monitoring and improving our environment, and many other fields. This unit will focus on the properties and reactivity of matter and is an ideal unit for any student that wants to understand the atomic and molecular world within and around them. It will introduce chemical and physical properties of solids, liquids and gases, metals and solutions. It will examine specific reactions including precipitation, acid base chemistry and oxidation/reduction processes and will explore the energetics and rates of chemical change. It will also describe methods of detection and analysis of matter. Specific biological, environmental and new materials related to real world examples will be provided, with topics such as global warming, energy production and renewable fuels. This unit will provide an understanding and appreciation of the role of chemical and biomolecular sciences in our lives, now and in the future, including in helping to achieve a sustainable environment, understanding health and disease, and advancing new molecular technologies. Practical sessions and tutorials will reinforce learning throughout this unit.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

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

**ULO1:** Explain the chemical and physical properties of solids, liquids and gases, metals and solutions.

**ULO2:** Predict reactions of matter including precipitation, acid base chemistry, oxidation/

reduction processes, and the energetics and rates of chemical change.

**ULO3:** Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.

**ULO4:** Undertake laboratory investigations requiring basic laboratory skills related to the reactions of matter and the energetics and rates of reaction, and their detection and analysis, and demonstrate an awareness of general laboratory safety procedures.

**ULO5:** Record and analyse scientific data, as well as judge its reliability and significance and interpret and communicate conclusions, including using the basic elements of scientific report preparation.

**ULO6:** Discuss the central role and impact of the chemical and biomolecular sciences concepts covered in this unit in our lives and its modern applications.

## General Assessment Information

### **PARTICIPATION in tutorials, quizzes, mid-term exam, practicals:**

- If you are unable to attend a practical class, exam, or hand in a form of **assessment due to illness or misadventure, you must submit a request for special consideration** no later than five (5) working days after the assessment task date or due date. Information for Special consideration can be found here: <https://students.mq.edu.au/study/my-study-program/special-consideration>
- **You should also immediately contact the Unit Convenor, Professor Robert Willows (robert.willows@mq.edu.au).**
- You may only attend the practical classes for which you are enrolled, as shown in your eStudent timetable.

### **Final grade:**

- Your final grade will be based on the mark from the aggregation of the individual assessments (in-class and online quizzes, mid-semester test, practical), but you must obtain a Pass grade or better (**40% or greater**) in the final examination to be awarded an overall Pass grade or better. That is, **you must meet this hurdle to be able to pass overall. If you get between 30-40% you will get a second attempt at the exam but ONLY if you can pass the unit with a grade of 40% in the final exam. The SECOND attempt is to demonstrate that you have obtained a minimum level of understanding to pass the unit and your maximum grade in the SECOND attempt will be 40%. It is university policy that you cannot improve your mark more than the hurdle boundary mark if you are given a SECOND attempt.**

## ONLINE QUIZZES

Due: 10 Weekly online quizzes from **Weeks 2-12** (Check iLearn as any weeks without a tutorial do not have a quiz). Weighting: **15%**

There will be 10 on-line quizzes. You will find that these quizzes assist you in revising the course material as the course progresses. Further specific details on the quizzes will be provided at the CHEM1002 iLearn site.

## PRACTICALS

Due: **Every practical** Weighting: **20%**

The pre-practical exercises, performance in the practical, the practical report, and the post-practical exercises will be used to calculate the final practical mark. The assessment tasks start off simple and build on skills and knowledge developed throughout the course.

Pre-practicals exercises for practicals 1, 3, 4 and 5 must be handed in online on iLearn by midday on the Monday **prior** to your scheduled practical class.

Attendance: **If you are unable to attend a practical class, exam, or hand in a form of assessment due to illness or misadventure, you must submit a Disruption to Studies notification at [ask.mq.edu.au](http://ask.mq.edu.au) no later than five (5) working days after the assessment task date or due date. You should also immediately contact the Unit Convenor, Professor Robert Willows ([robert.willows@mq.edu.au](mailto:robert.willows@mq.edu.au)).**

## MID SEMESTER TEST

Due: **Week 7** Weighting: **15%**

There will be a test in Week 7 that will cover lectures up to and including week 6 content. This is designed to give you specific feedback on your understanding of the topics up to this stage to assist you in your further study of the unit. See iLearn for location and details.

## FINAL EXAMINATION

Due: **University Examination Period** Weighting: **50%**

The final exam is designed to address specific understanding of all the topics presented within the course and to show that the knowledge obtained can be applied to new problems. Details of the final exam length will be made available as part of the publishing of the university exam timetable.

The final exam is a hurdle assessment and you will need to get  $\geq 40\%$  in the final exam to meet the hurdle. In the event that you make **a serious first attempt at the final exam**, you will be provided with an opportunity to sit a new final exam to meet the hurdle. The faculty define a serious attempt as a mark of 10% below the hurdle which in this instance is a mark between 30-40%. **You will NOT be given a second attempt to pass the exam if you get below 30% in your first attempt.**

**Final Examination Details:** The examination timetable will be available in Draft form

approximately eight weeks before the commencement of the examinations and in final form approximately four weeks before the commencement of the examinations. You are expected to present yourself for examination at the time and place designated by the University in the Examination Timetable. This could be any day after the final week of semester and up until the final day of the official examination period. It is Macquarie University policy to **not set early examinations** for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is, the final day of the official examination period. **NOTE: If you apply for a supplementary examination, you must make yourself available in the week following the regular exam period. If you are not available at that time, there is no guarantee an additional examination time will be offered. Specific examination dates and times will be determined at a later date.**

The only exception to sitting an examination at the designated time is because of documented illness or unavoidable disruption. Absence from the final exam will result in a grade of F except in the case of a genuine medical emergency or misadventure as defined by the University (see below). In these circumstances you should apply for a Supplementary Exam at [ask.mq.edu.au](http://ask.mq.edu.au).

## Assessment Tasks

Name	Weighting	Hurdle	Due
<a href="#">Online Quizzes</a>	15%	No	Week 2-12
<a href="#">Practical and Tutorial participation</a>	0%	Yes	Week 2-12
<a href="#">Mid Semester test</a>	15%	No	Week 7 (see iLearn)
<a href="#">Laboratory work</a>	20%	No	Each Lab class
<a href="#">Final Examination</a>	50%	Yes	University Exam Period

### Online Quizzes

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 13 hours

Due: **Week 2-12**

Weighting: **15%**

There will be 10 on-line quizzes during semester. You will find that these quizzes assist you in revising the course material as the course progresses.

On successful completion you will be able to:

- Explain the chemical and physical properties of solids, liquids and gases, metals and

solutions.

- Predict reactions of matter including precipitation, acid base chemistry, oxidation/reduction processes, and the energetics and rates of chemical change.
- Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.
- Discuss the central role and impact of the chemical and biomolecular sciences concepts covered in this unit in our lives and its modern applications.

## Practical and Tutorial participation

Assessment Type <sup>1</sup>: Participatory task

Indicative Time on Task <sup>2</sup>: 0 hours

Due: **Week 2-12**

Weighting: **0%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

You must participate in minimum of 8 tutorial classes and 4 of 5 practical classes. This is a hurdle requirement.

On successful completion you will be able to:

- Explain the chemical and physical properties of solids, liquids and gases, metals and solutions.
- Predict reactions of matter including precipitation, acid base chemistry, oxidation/reduction processes, and the energetics and rates of chemical change.
- Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.
- Undertake laboratory investigations requiring basic laboratory skills related to the reactions of matter and the energetics and rates of reaction, and their detection and analysis, and demonstrate an awareness of general laboratory safety procedures.
- Record and analyse scientific data, as well as judge its reliability and significance and interpret and communicate conclusions, including using the basic elements of scientific report preparation.
- Discuss the central role and impact of the chemical and biomolecular sciences concepts covered in this unit in our lives and its modern applications.

## Mid Semester test

Assessment Type <sup>1</sup>: Quiz/Test

Indicative Time on Task <sup>2</sup>: 6 hours

Due: **Week 7 (see iLearn)**

Weighting: **15%**

### Mid Semester Test

On successful completion you will be able to:

- Explain the chemical and physical properties of solids, liquids and gases, metals and solutions.
- Predict reactions of matter including precipitation, acid base chemistry, oxidation/reduction processes, and the energetics and rates of chemical change.
- Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.

## Laboratory work

Assessment Type <sup>1</sup>: Lab report

Indicative Time on Task <sup>2</sup>: 15 hours

Due: **Each Lab class**

Weighting: **20%**

The pre-practical exercises, performance in the practical, the practical report, and the post-practical exercises will be used to calculate the final practical mark. The assessment tasks start off simple and build on skills and knowledge developed throughout the course.

On successful completion you will be able to:

- Predict reactions of matter including precipitation, acid base chemistry, oxidation/reduction processes, and the energetics and rates of chemical change.
- Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.
- Undertake laboratory investigations requiring basic laboratory skills related to the reactions of matter and the energetics and rates of reaction, and their detection and analysis, and demonstrate an awareness of general laboratory safety procedures.

- Record and analyse scientific data, as well as judge its reliability and significance and interpret and communicate conclusions, including using the basic elements of scientific report preparation.

## Final Examination

Assessment Type <sup>1</sup>: Examination

Indicative Time on Task <sup>2</sup>: 25 hours

Due: **University Exam Period**

Weighting: **50%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

It is designed to address specific understanding of all the topics presented within the unit and to show that the knowledge obtained can be applied to new problems.

On successful completion you will be able to:

- Explain the chemical and physical properties of solids, liquids and gases, metals and solutions.
- Predict reactions of matter including precipitation, acid base chemistry, oxidation/reduction processes, and the energetics and rates of chemical change.
- Utilise chemistry and biomolecular sciences concepts covered in this unit to process and interpret relevant chemical data.
- Discuss the central role and impact of the chemical and biomolecular sciences concepts covered in this unit in our lives and its modern applications.

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<sup>1</sup> If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

<sup>2</sup> Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

## Delivery and Resources

### Required Textbook:

Top Hat General Chemistry AUS Edition: Franklin Ow et al: ISBN: 978-1-77330-520-2



Register at <https://app.tophat.com/register/student/> for the text book and access to the Tutorial Questions, Quizzes and Homework problems.

Join code: See iLearn for details

Note that the textbook includes Tutorial questions, Quizzes and Homework problems.

Access is free when you are within the University Library Zone. Access outside this zone requires a paid subscription. It is highly advisable to purchase a subscription unless you plan to attend university each week to access the text in the free zone. The online quizzes and homework/tutorial questions are conducted through this resource.

## Lectures (Online)

2020 Lectures will be live online via ZOOM. Lectures and powerpoint slides will be available through iLEARN ECHO. Recordings of the 2019 S2 offering will also be available prior to the live lectures. Lectures will also include working through examples of problems, to strengthen and increase understanding of the concepts. Learning is an active process, and as such, you must engage with the material. This means downloading and reading the lecture notes and relevant sections of the textbook (and beyond) before and after listening to the lectures is strongly recommended. Weekly on-line quizzes will also be provided so it is strongly recommended that you listen and work through lecture examples prior to completing these quizzes. The quizzes are timed. The quizzes and mid session test are designed to allow you to continuously learn and to identify what you understand and the areas that you need to spend more time on, with minimal assessment penalty.

## Tutorials (On Campus and Online offerings)

Tutorials will be run to assist your understanding of the course material. Attempting the questions before the tutorial class to identify what you need assistance on is highly recommended. The tutor will often ask for students to assist in answering the questions throughout the class. Participation records will be kept and logged. Anonymous teaching evaluations from past students have identified tutorials as a valuable learning tool and participation is thus a hurdle requirement for passing the unit.

## Laboratory classes (On campus)

Practical classes are designed to develop basic laboratory skills, general safety practices and critical and analytical thought. Pre-practical questions are designed to make sure you are ready for the practical work and have grasped the relevant theory and safety practices necessary. The pre-practical questions MUST be submitted on-line through iLearn by noon (12pm) Monday prior to the scheduled practical class. In-lab and post-lab work are designed to allow you to appropriately record your experimental observations and your calculations in a detailed and accurate manner and assess your understanding of the theory behind the experiments conducted and to use this understanding to solve related problems. The practicals are scaffolded such that the expectations of pre-practical, in-practical and post-practical reports increase throughout the course as understanding of the concepts and skill in how to record the data and interpret results develops.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>).

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

## Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](https://ask.mq.edu.au) or if you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](https://mq.edu.au/learningskills)) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

- [Getting help with your assignment](#)
- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

If you are a Global MBA student contact [globalmba.support@mq.edu.au](mailto:globalmba.support@mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Changes since First Published

Date	Description
10/09/2020	Timing for final exam and midsemester exam removed. Time for final exam will be dependent on university approval of on-campus or online exams.
22/07/2020	Changes to tutorial description as Labour day is during week 8 not 9. Schedule change required.