CBMS107

Foundations of Chemical and Biomolecular Sciences 1

S2 External 2019

Dept of Molecular Sciences

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General Information

Unit convenor and teaching staff

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Available at iLearn.

Lecturer
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Credit points
3

Prerequisites

Corequisites

Co-badged status

Unit description
Foundations of Chemical and Biomolecular Sciences 1 introduces students to the principles and practical aspects of the molecular sciences, from the smallest of chemical substances through to the molecules of life – the biomolecules. This unit does not assume prior knowledge of chemistry or biology and is ideal for any student that wants to understand the atomic and molecular world within and around them. It will commence with the language of chemistry by introducing atoms and molecules and elements and compounds and using representative inorganic and organic compounds, including biomolecules, to show how their structures, functions and reactions are described. It will build on this language to allow prediction of the reactivity, behaviour and function of different classes of compounds, with a focus on acids and bases and organic compounds including biomolecules. Contemporary applications will be highlighted to show 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:

Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.
Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

General Assessment Information

Your marks will be displayed at iLearn. It is your responsibility to regularly verify that the records displayed at iLearn (Tools -> Grades) are correct.

If you fail to attend a hurdle assessment task, please contact the Unit Convenor as soon as possible, as well as applying for special consideration. Please note that special consideration applications must be made within five working days of the assessment task due date.

Final grade:

- Your final grade will be based on the mark from the aggregation of your individual assessments (practical, quizzes, mid-session test, final exam), noting that you must satisfy all hurdles (participation and mid-session test) to pass CBMS107 overall.

Attendance at practical classes and tutorial classes:

- You must attend and participate in all four practical classes to pass CBMS107.
- You must attend and participate in tutorials to pass CBMS107.
- Please note that if you miss a practical class or a tutorial class, **we are not required to**

offer you a make-up class.

Mid-session test:

- The mid-session test is a hurdle assessment and you will need to get >= 40% to meet the hurdle. In the event that you make a serious first attempt at the mid-session test, you will be provided with an opportunity to sit a new test 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 mid-session test if you get below 30% in your first attempt.
- The mid-session test will be held during the second on-campus session, as this will give failing students time to withdraw without academic penalty. Note that the **last day to withdraw without academic penalty is Saturday 28 September 2019**.
- Students that fail the mid-session test hurdle **MAY** be able to re-sit the test during the second week of the semester break. Regrettably, however, we cannot guarantee that this will occur and you may have to re-sit the test **AFTER** the last day to withdraw without academic penalty.
- Historically, students that do poorly in the mid-session have an unfortunately high failure rate, which is our motivation for applying a hurdle to the mid-session test.

Final examination:

- The final examination will be a two-hour written examination (plus ten minutes' reading time) and will be held during the examination period.

Information on Supplementary Exams:

If you receive special consideration for the final examination, a supplementary examination will be scheduled in the interval between the regular examination period and the start of the next session. By making a special consideration application for the final examination you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure that you are familiar with the policy prior to submitting an application. You can check the supplementary examination information page on FSE101 in iLearn (bit.ly/FSESupp) for dates, and approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

Assessment Tasks

Name	Weighting	Hurdle	Due
Participation	0%	Yes	Every class

Name	Weighting	Hurdle	Due
Tutorial Quizzes	5%	No	Every tutorial class
Online Quizzes	5%	No	Weeks 9 and 12
Practical Classes	20%	No	Every practical class
Mid-Session Test	20%	Yes	Second on-campus session
Final Examination	50%	No	University examination period

Participation

Due: **Every class**
Weighting: **0%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

You must attend and participate in all four practical classes to pass CBMS107.

You must attend and participate in all tutorial sessions to pass CBMS107.

The learning materials required for CBMS107 are available to you at iLearn. However, as this is an external unit, lectures, tutorials (SGTA) and practical classes are held during on-campus sessions. There are three on-campus sessions and you must attend all 7 days.

- On-campus session **1**: 24th and 25th August
- On-campus session **2**: 17th, 18th and 19th September
- On-campus session **3**: 19th and 20th October

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Tutorial Quizzes

Due: **Every tutorial class**
Weighting: **5%**

Please note that the quiz questions will be based on the tutorial (SGTA) question sets available at iLearn.

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Online Quizzes

Due: **Weeks 9 and 12**
Weighting: **5%**

There will be two online quizzes which you will find assist you in revising the organic course material.

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.

Practical Classes

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

Four practical classes worth 5% each. The pre-practical exercises, performance in the practical, the practical report, and the post-practical exercises will be used to calculate the final mark for

each practical class. Please note that participation in the practical classes is a hurdle and that you must attend all four practical classes to pass CBMS107.

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.
- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Mid-Session Test

Due: **Second on-campus session**
Weighting: **20%**
This is a hurdle assessment task (see assessment policy for more information on hurdle assessment tasks)

There will be a mid-session test during the second on-campus session that will be designed to give you specific feedback on your understanding of the topics up to this stage of the unit.

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

Final Examination

Due: **University examination period**
Weighting: **50%**

The final examination will be designed to address specific understanding of all topics presented within the course and to show that the knowledge obtained can be applied to new problems**.**

On successful completion you will be able to:

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

Delivery and Resources

Communication

During the semester, the CBMS107 iLearn site will be used to communicate important information to you. In addition, email will be sent by email to your student email account on a frequent basis.

We cannot overstate the importance of **regularly checking your email and the CBMS107 iLearn site, in particular the student forum**.

Classes

A daily schedule of activities for the on-campus sessions will be provided at iLearn.

- **Lectures:**

Recordings from first semester are available at the CBMS107 iLearn site. However, other material will be provided during the on-campus sessions.

- **Tutorials:**

During tutorials, the problems assigned (available at the CBMS107 iLearn site) will be discussed. We recommend that you work on the tutorial question sets before coming to class, so that you can take full advantage of the exercises.

- **Practicals**:

The practical classes for CBMS107 are run in 14SCO 320 and 14SCO 308 (note that these rooms are connected). **You are not be allowed to enter the laboratory unless you are wearing enclosed footwear.** Safety glasses, laboratory coats and disposable gloves are

supplied. Please note that we cannot guarantee that the lab coats that we supply are in good condition, as they are shared across the unit. We recommend that you consider purchasing your own laboratory coat, particularly if you are a science major.

Teaching and Learning Strategy

CBMS107 is a 3 credit-point, half-year unit and will require an average of 9 hours study per week (contact hours plus self-study time). For students with weak chemistry backgrounds, more than 9 hours per week will be necessary to perform satisfactorily in this unit.

CBMS107 is designed to introduce you to the principles of the molecular sciences, including developing an understanding of the practical skills required to undertake simple chemistry experiments in an efficient and safe manner. The lecture materials, tutorials and practical classes complement each other, and along with quizzes, have been developed to increase your understanding of the topics so that you can achieve the learning outcomes.

The unit expectation is that you will:

· Watch the lecture recordings and attend the lectures presented at the on-campus sessions

· Actively engage in the tutorial classes and attempt the set exercises

· Demonstrate reasonable competence in all practical exercises

· Spend an average of no less than 4 hours per week of private study in addition to class contact

If you prepare for, and attend, all components of the unit and work consistently and continuously throughout the semester, you should be able to develop a strong understanding of the general chemistry and organic chemistry presented, and perform satisfactorily in this unit. Students who try to memorise just before exams do not do well in this unit - this is especially true for organic chemistry content.

· **Lectures** will be presented formally, although quizzes and general questions may be asked in class, demonstrations provided, and examples of problems worked through, to strengthen and increase understanding of the concepts. Please note that based on observations of related units, we know that students fall behind and perform poorly if they do not attend the lecture classes. Learning is an active process, and as such, you must engage with the material. Reviewing lecture notes and relevant sections of the textbook (and beyond) before and after the on-campus sessions is strongly recommended.

· **Tutorials (SGTA) classes** are run to assist your understanding of the course material. Attempting the questions before the tutorial class to identify areas in which you need assistance is highly recommended. Past experience has demonstrated that there is a strong correlation between success in the unit and the level of effort put in to preparing for SGTA classes.

· **Practical classes** are designed to develop basic laboratory skills, general safety practices, as well as 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 necessary safety practices. In-lab work is designed to teach you to appropriately record your experimental

observations and to present your calculations in a detailed manner. Post-lab exercises are designed to assess your understanding of the experiments conducted.

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). 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.)*

Undergraduate students seeking more policy resources can visit the 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).

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 or if you are a Global MBA student contact 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) provides academic writing resources and study

strategies to improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

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

If you are a Global MBA student contact 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/.

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.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Assessment tasks

- Practical Classes
- Final Examination

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Assessment tasks

- Participation
- Practical Classes

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcome

- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

Assessment tasks

- Online Quizzes
- Practical Classes
- Mid-Session Test
- Final Examination

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Use the language and principles of chemical science to be able to explain the

composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

Assessment tasks

- Tutorial Quizzes
- Online Quizzes
- Practical Classes
- Mid-Session Test
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcome

- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.

Assessment tasks

- Tutorial Quizzes
- Online Quizzes
- Practical Classes
- Mid-Session Test
- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in

order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.

Assessment tasks

- Tutorial Quizzes
- Online Quizzes
- Practical Classes
- Mid-Session Test
- Final Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Use the language and principles of chemical science to be able to explain the composition and properties of matter and name and write (or describe) structures and reactions for representative inorganic and organic compounds including biomolecules.
- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Acquire basic laboratory skills in the chemical and biomolecular sciences, including an understanding of general laboratory safety procedures.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.

Assessment tasks

- Tutorial Quizzes
- Practical Classes
- Mid-Session Test
- Final Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Apply knowledge of chemistry concepts to describe the structure and properties of inorganic and organic compounds to predict their reactivity, behaviour and function.
- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Record and analyse scientific data, as well as communicate conclusions using the basic elements of scientific report preparation.
- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Assessment task

- Practical Classes

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Use the principles of chemical and biomolecular sciences to solve problems, process and interpret data, and have an understanding of where to apply these principles.
- Record and analyse scientific data, as well as communicate conclusions using the basic

elements of scientific report preparation.

- Discuss the central role and impact of the chemical and biomolecular sciences in our lives and its modern applications.

Assessment task

- Practical Classes

Changes from Previous Offering

A mid-session test hurdle has been introduced.

Teaching staff

Dr Damian Moran, Unit Convenor, 4WW 329, ph 02 9850 8299, email damian.moran@mq.edu.au. Please see iLearn for consultation hours.

A/Prof Joanne Jamie, Lecturer, 4WW 231, ph 02 9850 8283, email joanne.jamie@mq.edu.au. Please see iLearn for consultation hours.

Dr Moran and A/Prof Jamie will be presenting the lectures. Dr Moran is the convenor of this unit and should be consulted in relation to administrative issues.