



# CBMS602

## General Chemistry

S1 Day 2016

*Dept of Chemistry & Biomolecular Sciences*

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#### Disclaimer

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## General Information

Unit convenor and teaching staff

Lecturer, Tutor

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Building E8C Room 305

Tuesday to Friday (9am to 4pm) by appointment

Unit Convenor

Ian Jamie

[ian.jamie@mq.edu.au](mailto:ian.jamie@mq.edu.au)

Contact via [ian.jamie@mq.edu.au](mailto:ian.jamie@mq.edu.au)

F7B 236

Anytime

Credit points

4

Prerequisites

Admission to MLabQAMgt or MRadiopharmSc or MSc or MBiotech or MBiotechMCom

Corequisites

Co-badged status

### Unit description

Chemistry stands at the forefront of change in the twenty-first century. It is the basis for the development of new medicines, new materials, new ways of monitoring and improving our environment through green technologies, and many other rapidly advancing fields. In this unit students learn the principles of physical, inorganic and general chemistry, gaining insights into the electronic structure of atoms, the properties of molecules and the role of energy in chemical change. The unit also allows students to develop critical skills in solving quantitative problems that serve them well in later studies. The physical properties of solids, liquids and gases; metals, semi-conductors and insulators; electrolyte solutions; synthetic polymers; and biomolecules are discussed. Another important focus of the unit is on the control of chemical reactions through changing the rates of reactions or by altering the concentrations of compounds present at equilibrium. Reactions involving acids, oxidising agents and metal complexes are discussed, and an introduction to thermodynamics and electrochemistry is presented. All of the chemical principles explored in the unit are illustrated by economically, environmentally and biologically important examples from the real world, thereby enhancing students' understanding and allowing them to appreciate the role of chemistry in everyday life.

## 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:

At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.

At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data, using several fundamental chemico-physical rules and an understanding of where to apply them

At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.

At the completion of this unit you will be able demonstrate that you can accurately record your laboratory observations and interpret and communicate the outcomes in formal laboratory reports in a manner commensurate with professional chemistry;

At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Assessment Tasks

Name	Weighting	Due
<u>Practicals</u>	25%	Week 2-13
<u>Post-Labs Exercises</u>	0%	Weeks 3-13
<u>On-line Assignments</u>	15%	Weeks 3-13
<u>Mid-Session Test</u>	10%	21-April-2015
<u>Final Examination</u>	50%	June 2015

### Practicals

Due: **Week 2-13**

Weighting: **25%**

Six (6) laboratory practicals.

Required Components:

- *Prelab Exercises*
- *Attendance at Practical Session*
- *Practical Report*

On successful completion you will be able to:

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data, using several fundamental chemico-physical rules and an understanding of where to apply them
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- At the completion of this unit you will be able to demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental

applications and impacts of chemistry.

## Post-Labs Exercises

Due: **Weeks 3-13**

Weighting: **0%**

Up to 3% bonus marks will be awarded for the six (6) sets of post-laboratory exercises.

On successful completion you will be able to:

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data, using several fundamental chemico-physical rules and an understanding of where to apply them
- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## On-line Assignments

Due: **Weeks 3-13**

Weighting: **15%**

On-line Assignments using Mastering Chemistry

On successful completion you will be able to:

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data, using several fundamental chemico-physical rules and an understanding of where to apply them
- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Mid-Session Test

Due: **21-April-2015**

Weighting: **10%**

The Mid-Session Test will examine topics from the first half of the semester.

On successful completion you will be able to:

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data , using several fundamental chemico-physical rules and an understanding of where to apply them
- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Final Examination

Due: **June 2015**

Weighting: **50%**

The final Examination will test all topics of the unit

On successful completion you will be able to:

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- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data , using several fundamental chemico-physical rules and an understanding of where to apply them
- At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.
- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Delivery and Resources

### Requirements and Expectations

CBMS602 is a 3-credit-point, one semester unit, comprising

- Lectures: three x one-hour lectures per week
- Tutorial: one x one-hour tutorial per week
- Practical: one four-hour laboratory session, every **second** week (six practicals in total).
- Self-Study: there is an expectation that you will also engage in study of the material outside of the formal face-to-face contact.

In order to complete this unit you must:

- Participate in **all** laboratory sessions and submit laboratory reports by the designated dates.
- Submit answers to the on-line tutorial exercises.
- Attempt the mid-session test (50 minutes), held during a standard lecture time.
- Sit the final examination of (3 hours), held during the examination period.

An unsatisfactory performance in the final examination or the practicals may result in a fail grade being given, regardless of your overall aggregate score.

Students unable to attend a laboratory class due to illness or misadventure (defined in the 'Student Information' section of the University Undergraduate Studies Handbook) should provide the University with documentation, including a medical certificate in appropriate, as soon as possible after any such absence. In special circumstances, it may be possible to attend an alternative laboratory class, but this must be arranged in advance with Dr Ian Jamie and it is not guaranteed,

If you miss more than one laboratory session through illness or misadventure, you should request withdrawal without penalty. If an absence is **anticipated** (perhaps for a mandatory religious event, etc), the student must inform teaching staff **in advance** that this will be the case, with sufficient notice to allow alternative arrangements to be made. It is your responsibility to undertake this. Notification *after* the event of an anticipatable absence will not be looked upon favourably. If you miss any laboratory session without adequate evidence of illness or misadventure, you may be awarded an FA grade and be given a failing SNG.

In addition to the formal requirements for the unit, there are other actions you should take to achieve your best in this unit.

The expectations are that you will:

- attend all lectures;
- attend all tutorial classes and attempt the assigned tutorial exercises;
- demonstrate competence in all laboratory preparation exercises before each class;

- demonstrate competence in the post-laboratory exercises submitted by the due dates (note, completion of these are optional, but are worthwhile doing and you get bonus marks).
- engage in private study in addition to class contact

### Unit Web Site

The **CBMS102** unit web site will be used as a repository of lecture, tutorial and prac notes, as a means of communication and as a source of data and information. You must become familiar with it. Note that this is **CBMS102**, not **CBMS602**.

The web page for this unit can be found at [ilearn.mq.edu.au](http://ilearn.mq.edu.au). Login and follow the prompts to **CBMS102**. You will be asked for a "username" and "password". Your "username" is your Macquarie Student ID Number, which is an 8-digit number found on your Campus Card. The "password" is your myMQ Student Portal password. This will be the original MQID password (2 random characters followed by your date of birth in ddmmyy format) that was sent to you on enrolment, unless you have already changed your password in the myMQ Student Portal. If you have any problems with iLearn log a ticket with OneHelp at [onehelp.mq.edu.au](http://onehelp.mq.edu.au). More information about OneHelp can be found at <http://informatics.mq.edu.au/help/>.

### Technology Used

You will also be required to use the MasteringChemistry online system for assessment tasks and practice problems. Details on its use will be supplied in class. You may purchase an access licence to the Mastering Chemistry website along with the textbook, or it may be purchased separately. A certain number of licenses may be obtained from Dr Ian Jamie for those students who have an equity case (i.e., financial or other constraints).

You are expected to access the ilearn site on a frequent basis and download PDF files. If you do not have your own computer you may wish to access the web resources on campus using the PC computers in the Library or in the C5C computer laboratories.

To view notes on all the topics and past exams on the unit web site, you will require Adobe Acrobat Reader Version 9 or later (or equivalent software) to be installed on your computer. Acrobat Reader can be downloaded from the Adobe at [get.adobe.com/reader/](http://get.adobe.com/reader/) (but be careful of the extra software that it will install by default - read carefully). If you are using the computers in the library, then Acrobat has already been installed.

Please note that information will also be sent by email to your student email account so please **look at your email account on a frequent basis**. Check your spam folder. It is not uncommon for mail from iLearn to be initially recognised as spam. All unit-related correspondence must be conducted using your official university account. E-mails from your private accounts will be responded to via your MQ email account.



## Unit Schedule

### CBMS602 Lecture and Practical Schedule

**Note: This schedule is approximate and may be altered as required. Locations may change, please check the official university timetable.**

#### Lectures:

Attend all:

Tuesday, E7B T5 11 am–12 noon

Thursday, E7B T5 11 am–12 noon

Friday, E7B T5, 9–10 am

Week 1: Introductions, Revision of basic concepts, Stoichiometry and Reactions

Week 2: Stoichiometry and Reactions (cont.), Gas Laws and Kinetic Theory of Matter

Week 3: Kinetic Theory of Matter (cont.), Chemical Kinetics

Week 4: Chemical Kinetics (cont.), Principles of Chemical Equilibria

Week 5: Principles of Chemical Equilibria (cont.), Acid-Base Equilibria

Week 6: Acid-Base Equilibria (cont.), Buffers, Precipitation and Complex Ion Equilibria

Week 7: Electrochemistry

Week 8: Mid-Semester Test, Modern Atomic Theory

Week 9: Modern Atomic Theory (cont.), Chemical Bonding and Molecular Geometry

Week 10: Chemical Bonding and Molecular Geometry (cont.), Transition Metal Chemistry

Week 11: Transition Metal Chemistry (cont.), Thermochemistry and Chemical Energy

Week 12: Thermochemistry and Chemical Energy (cont)

Week 13: Liquids and Solids, Environmental (Applied) Chemistry, Revision

#### Practicals:

Choose one of:

Tuesday, E7B 320 2-6 pm

Wednesday, E7B 320 2-6 pm

Week 1: No Labs

Week 2: Even Week Group - Experiment 1: Stoichiometry and Volumetric Analysis

Week 3: Odd Week Group - Experiment 1: Stoichiometry and Volumetric Analysis

Week 4: Even Week Group - Experiment 2: Chemical Kinetics

Week 5: Odd Week Group - Experiment 2: Chemical Kinetics

Week 6: Even Week Group - Experiment 3: Dissociation Constants of Weak Acids and Bases

Week 7: Odd Week Group - Experiment 3: Dissociation Constants of Weak Acids and Bases

Week 8: Even Week Group - Experiment 4: Solubility and Complex Equilibria

Week 9: Odd Week Group - Experiment 4: Solubility and Complex Equilibria

Week 10: Even Week Group - Experiment 5: Reduction-Oxidation Reactions

Week 11: Odd Week Group - Experiment 5: Reduction-Oxidation Reactions

Week 12: Even Week Group - Experiment 6: Coordination Compounds: Synthesis, Thermodynamics, Equilibria and Quantum Mechanics

Week 13: Odd Week Group - Experiment 6: Coordination Compounds: Synthesis, Thermodynamics, Equilibria and Quantum Mechanics

### **Tutorials:**

#### ***Tutorials commence in Week 1.***

Choose one of:

Wednesday, W6B 383 9-10 am

Wednesday, E5A 150 1-2 pm

Friday, E6A 108 1-2 pm

Friday, C5C 236 2-3 pm

## **Learning and Teaching Activities**

### **Lectures**

Lectures will summarise important topics in fundamental chemistry and guide you to the appropriate areas to study.

### **Tutorials**

Tutorials will provide you with the opportunity to practice your problem-solving skills.

### **Practicals**

Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.

## On-line Assignments

These assignments focus your study and provide a measure of progress of the development understanding of the topics.

## Self-Study

You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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](http://ask.mq.edu.au).

## Student Support

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

[dents.mq.edu.au/support/](https://dents.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 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](https://ask.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.

## 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:

### Learning outcomes

- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret, in a manner commensurate with professional chemistry, chemistry data, using several fundamental chemico-physical rules and an understanding of where to apply them
- At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.
- At the completion of this unit you will be able demonstrate that you can accurately record your laboratory observations and interpret and communicate the outcomes in formal

laboratory reports in a manner commensurate with professional chemistry;

- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Assessment tasks

- Practicals
- Post-Labs Exercises

## Learning and teaching activities

- Lectures will summarise important topics in fundamental chemistry and guide you to the appropriate areas to study.
- Tutorials will provide you with the opportunity to practice your problem-solving skills.
- Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.
- You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## 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

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## 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 outcomes

- At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.
- At the completion of this unit you will be able demonstrate that you can accurately record your laboratory observations and interpret and communicate the outcomes in formal laboratory reports in a manner commensurate with professional chemistry;
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## Assessment tasks

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- On-line Assignments
- Mid-Session Test
- Final Examination

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- Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.
- These assignments focus your study and provide a measure of progress of the development understanding of the topics.
- You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## 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

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
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## 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 outcomes

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- You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## 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

- At the completion of this unit you will be able to demonstrate an understanding of some

fundamental general chemistry principles, applicable to chemistry and other science disciplines.

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## 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**

- At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.
- At the completion of this unit you will be able demonstrate that you can accurately record your laboratory observations and interpret and communicate the outcomes in formal laboratory reports in a manner commensurate with professional chemistry;
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## **Assessment tasks**

- Practicals
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- Final Examination

## **Learning and teaching activities**

- Tutorials will provide you with the opportunity to practice your problem-solving skills.
- Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.

## **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

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able to demonstrate basic chemistry-laboratory skills and an understanding of general laboratory safety procedures.
- At the completion of this unit you will be able demonstrate an awareness of the national and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Assessment tasks

- Practicals
- Final Examination

## Learning and teaching activities

- Lectures will summarise important topics in fundamental chemistry and guide you to the appropriate areas to study.
- Tutorials will provide you with the opportunity to practice your problem-solving skills.
- Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.
- You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## 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

- At the completion of this unit you will be able to demonstrate an understanding of some fundamental general chemistry principles, applicable to chemistry and other science disciplines.
- At the completion of this unit you will be able demonstrate an awareness of the national

and international context in which chemistry operates, and the social and environmental applications and impacts of chemistry.

## Assessment tasks

- Practicals
- Post-Labs Exercises
- On-line Assignments
- Mid-Session Test
- Final Examination

## Learning and teaching activities

- Lectures will summarise important topics in fundamental chemistry and guide you to the appropriate areas to study.
- Tutorials will provide you with the opportunity to practice your problem-solving skills.
- Practicals give you an opportunity to put into practice your knowledge of fundamental chemistry, and to develop the real laboratory skills that are valued in the profession of chemistry.
- You are expected to spend some time in reading the textbook and other sources of information on fundamental chemistry, to practice problem-solving, and to self-assess your degree of understanding.

## Changes from Previous Offering

There are no significant changes from the previous offering

## Learning and Teaching Strategy

**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. Most lecture material will be available on the unit web site, while other material will be provided in the lecture class. **You are expected to download the lecture material and bring it into the lecture class** so you can spend most of the time listening to the lecturer rather than transcribing. **Do not assume these notes or recordings/ video recordings are a substitute to attending the lectures.** Students historically fall behind and perform poorly if they do not attend the lecture classes and often further material is provided in the lecture class, so a student that does not attend the class will not be as well prepared as they would otherwise be. 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** the lecture is given is strongly recommended.

**Tutorials** will be run to assist your understanding of the course material. Suggested questions to be covered for each tutorial class are provided in a separate document. 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. Attendance records will be kept, and while tutorials do not contribute formally to your mark, poor tutorial attendance may be viewed unfavourably and could affect the final mark if a student is on a grade boundary.

**Laboratory classes** are designed to develop basic laboratory skills, general safety practices and critical and analytical thought. Pre-laboratory questions are designed to make sure you are ready for the laboratory work and have grasped the relevant theory and safety practices necessary. 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 laboratory experiments are scaffolded such that the expectations of pre-lab, in-lab and post-lab reports increase throughout the course as understanding of the concepts and skill in how to record the data and interpret results develop. Note that for CBMS602 the practicals form the main differentiation between CBMS602 and CBMS102. For the laboratory report you are required to submit a full report, written yourself, and submitted as an electronic document through the CBMS102 iLearn website.

If you do your work in a timely and conscientious way and follow the study methods suggested below, you will do well in the unit.

Your success will depend primarily on your being able to LOGICALLY analyse the wording on the chemical problems in tutorial exercises, online assignments and examinations, and relate the problems to basic concepts and mathematical expressions. For most students, the best way to learn the material is to work on the tutorial exercises independently. Good analytical skills and problem solving techniques must be acquired in order to pass the examinations that consist solely of problems – rote memorisation of the book will not allow you to achieve a good mark. Memorise by learning, but do not learn by memorising. Chemistry is a cumulative subject where one principle builds upon another and you will need to stay on top of the materials at all times.

If you experience difficulties with understanding the unit material, then seek help early! The lecturers are always happy to assist you as long as show that you have made an attempt to overcome the hurdles yourself.

Some suggested guides in studying CBMS602 are:

- Read up the relevant sections in the textbook before the lecture on a particular topic. Check for important learning objectives and key concepts at the end of the chapter.
- Re-read the relevant sections after the lecture, focussing on points emphasised in the lecture and in those sections, if any, that you did not understand completely.
- Do the assigned tutorial problems. Check your answer to each problem to make sure you have done the problem correctly. Do not spend excessive amounts of time struggling with a problem you cannot do. Seek help with the problem. Once you have found out the way to solve a particular problem, put the solution away and make sure you can do the

problem on your own. It is extremely important that you make certain you can do the problem yourself - just understanding it is not enough. The most common trap that students fall into is thinking that just because they understand the solution to the problem, they will be able to do a similar problem in an examination.

- If, after doing all the tutorial problems, you feel in need of more drill, do some of the unassigned problems. You will find some drills, discussions, animations and reviews of the concepts and the mathematics about the topics on the textbook publishers website.

Do not hesitate to seek help from Dr Ian Jamie or Dr Louise Brown with any material that you cannot master on your own. Studying with one or more friends often proves beneficial to everyone involved if the work is shared and everyone participates actively in the study group.

## Outside Commitments

Several studies on student progress have demonstrated that excessive hours of paid work and/or other activities, especially regular commitments, can have a detrimental effect on successful completion of studies. The (very approximate) time commitment for an undergraduate unit of study such as CBMS602 is 150 hours over 15 weeks (this includes the two weeks of "recess"), hence about 10 hours per week. This is therefore about 40 hours per week over the typical four units of study. This includes contact and non-contact hours. Some students may find that they need to devote more time than this. Care should be taken with additional regular commitments to ensure that you are not overloading yourself. Options might include cutting back on outside commitments during the session or reducing the number of units you undertake.

## Required and Recommended Texts and Gear

### Text Books and Notes

The prescribed texts are:

- Brown, LeMay, Bursten, Murphy, Woodward, Langford, Sagatys and George, **Chemistry: The Central Science**, 3rd Ed, Pearson Australia, 2013, ISBN: 9781442554603

and

- Blackman and Gahan, **Aylward and Findlay's SI Chemical Data**, 7th Ed, John Wiley and Sons, 2013, ISBN: 9780730302469

You are expected to have a copy of each book.

The SI Chemical Data book contains important information and should be brought to every laboratory session.

You must download the Laboratory Notes for CBMS602 from the CBMS102 website through iLearn (ilearn.mq.edu.au). There will be links to CBMS602-specific material within the CBMS102 iLearn site.



It is not possible to complete the practical component of the unit without these notes. For students unable to print out their own copies for good reason may make arrangements with the unit convenor, Dr Jamie.

Lecture and practical notes can be obtained from the CBMS102 website, through iLearn (ilearn.mq.edu.au).

Some basic high school level mathematical skills would also be useful in CBMS602. If you need to refresh basic mathematical skills, you may like to obtain a copy of

- Monk, **Maths for Chemistry, A Chemist's toolkit of calculations**, Oxford University Press, 2006

which is available in the CO-OP Bookshop. Limited copies of this book are available in the Library

## Calculators

It is important that you have a scientific calculator. Hand-held calculators will be used in laboratory sessions, for assignments, and in the final examination. Note that calculators with text retrieving, memory and graphing capabilities are not allowed in the final examination.

The University provides general-use computers, but it would be advantageous to have your own computer and internet access.

## Personal Protective Equipment

A lab coat is required for the practicals, as are closed-in shoes. Students will be barred from undertaking a practical if they do not adhere to this requirement, with significant consequences for their grades.

You may wish to purchase your own safety glasses, but this will be supplied by the Department if you don't have your own.

# Special Consideration Requests

## Special Consideration Requests including non-attendance and extensions

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a student is prevented by unavoidable disruption from performing in accordance with their ability. The University has a policy on special consideration request that may be found at [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html). The University recognises that at times an event or set of circumstances may occur that:

- could not have reasonably been anticipated, avoided or guarded against by the student  
AND
- was beyond the student's control AND



- caused substantial disruption to the student's capacity for effective study and/or completion of required work AND
- substantially interfered with the otherwise satisfactory fulfilment of a unit or program requirements AND
- was of at least three (3) consecutive days duration within a study period and/or prevented completion of a formal examination.

This policy is instituted to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. To request special consideration go on-line to [ask.mq.edu.au](http://ask.mq.edu.au) as soon as possible to allow due consideration.

This Policy applies only to *serious and unavoidable* disruptions that arise **after** a study period has commenced. Such disruptions commonly result from personal, social or domestic nature and may include illness (either physical or psychological), accident, injury, societal demands (such as jury service), bereavement, family breakdown or unexpected changes in employment situations. Students with a pre-existing disability/health condition or prolonged adverse circumstances may be eligible for ongoing assistance and support. Such support is governed by other policies and may be sought and coordinated through Campus Wellbeing and Support Services.

**Non-Attendance:** Students who have a valid reason for the non-attendance (*via* special consideration formally approved by the unit coordinator), if one laboratory class is missed, that class will not be included in the calculation of the aggregate mark. If more than one laboratory class is missed you must speak to Dr Jamie to discuss alternative options. If the final exam is missed due to a valid reason a Supplementary Examination can be granted. If a Supplementary Examination is granted, the examination will be scheduled after the conclusion of the official examination period. The offer of a supplementary examination is at the discretion of the unit coordinator and you should not assume that it will be provided. Supplementary Examinations are **not make-up exams**, *i.e.*, a poor result in the final examination is not reason to request a supplementary examination. **Please note that if you are sick at or in the days just prior to the scheduled exam time you must see a medical practitioner and contact the unit coordinator as soon as possible to discuss the possibility of a supplementary exam.** It is normally unwise to sit an exam if illness or other circumstances will significantly affect your performance. Please also note that if you have sat the final exam you **CAN NOT** sit a supplementary exam even if you were ill during the final exam.

If an absence is **anticipated** (perhaps for a mandatory religious or University associated sporting event) you must inform the unit convenor **in advance** that this will be the case and discuss alternative arrangements. It is your responsibility to undertake this. Notification after the event of an anticipated absence will not be looked upon favourably. For any unjustified absences students will receive a zero mark for the assessment task.

**Extensions:** Students unable to complete a form of assessment (laboratory reports, quizzes) on time due to illness or other extenuating circumstances must request special consideration at [ask.mq.edu.au](http://ask.mq.edu.au) and provide formal documentary evidence as soon as possible and contact Dr Ian Jamie to discuss possible extensions. Extensions will be granted based on merit and will be more favourably considered if consultation with the unit coordinator on the need for an extension

occurred BEFORE the due date. **If there is no acceptable reason for a late submission, marks will be deducted at up to 5% for every day late.**