



CBMS102

General Chemistry

S1 Day 2014

Chemistry and Biomolecular Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	8
<u>Learning and Teaching Activities</u>	9
<u>Policies and Procedures</u>	10
<u>Graduate Capabilities</u>	11
<u>Changes since Last Offering</u>	20
<u>Learning and Teaching Strategy</u>	20
<u>Outside Commitments</u>	22
<u>Required and Recommended Texts and Ge ar</u>	22
<u>Special Consideration Requests</u>	23
<u>Changes since First Published</u>	24

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.

General Information

Unit convenor and teaching staff

Lecturer, Tutor

Louise Brown

louise.brown@mq.edu.au

Contact via louise.brown@mq.edu.au

Building F7B Room 335

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

Unit Convenor

Ian Jamie

ian.jamie@mq.edu.au

Contact via ian.jamie@mq.edu.au

F7B 236

Anytime

Lecturer, Tutor

Danny Wong

danny.wong@mq.edu.au

Contact via danny.wong@mq.edu.au

F7B 235

Credit points

3

Prerequisites

CBMS101 or HSC Chemistry Band 4

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 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 to record experimental results and interpret and communicate conclusions based on observations.

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>	15%	Week 2-13
<u>Post-Labs Exercises</u>	0%	Weeks 3-13
<u>On-line Assignments</u>	20%	Weeks 3-13
<u>Mid-Session Test</u>	15%	29-May-2014
<u>Final Examination</u>	50%	June 2014

Practicals

Due: **Week 2-13**

Weighting: **15%**

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 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 to record experimental results and interpret and communicate conclusions based on observations.
- 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.

Post-Labs Exercises

Due: **Weeks 3-13**

Weighting: **0%**

A 3% bonus mark will be awarded for satisfactory work in completing all 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 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: **20%**

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 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: **29-May-2014**

Weighting: **15%**

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 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 2014**

Weighting: **50%**

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 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

CBMS102 is a 3-credit-point, one semester unit, comprising

- Lectures: three one-hour lectures a week
- Tutorial: one one-hour tutorial per week
- Practical: a four-hour laboratory session every second week.

- Self-Study: here 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 computer 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.

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 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. 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 and make alternative arrangements. It is the responsibility of the student 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.

A satisfactory level of performance in the laboratory component must be achieved independently of your overall aggregate mark in order to gain pass CBMS102.

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 tutorial exercises from the textbook in addition to computer-based questions
- 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 CBMS 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. The web page for this unit can be found at ilearn.mq.edu.au. Login and follow the prompts to CBMS102. You will be asked for a username and password. Your User Name 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. More information about OneHelp can be found at <http://informatics.mq.edu.au/help/>.

Technology Used

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 to be installed on your computer. Acrobat Reader can be downloaded from the Adobe at 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 information will also be sent by email to your student email account so please **look at your email account on a frequent basis**.

You will also be required to use the Mastering Chemistry online system for assessment tasks and practice problems. Details on its use will be supplied in class. You may purchase an access licences 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.

Unit Schedule

This Unit Schedule is subject to change.

		Lectures			Practicals
		Tuesday	Tuesday	Wednesday	
Week Number	Week starting	E7B T4 11:00 am – 12:00 n	E7B T4 12:00 n – 12:00 pm	E7B T2 12:00 n – 1:00 pm	E7B 320 2:00 - 6:00 pm

1	3-Mar-14	Stoichiometry	Stoichiometry	Stoichiometry	No Prac
2	10-Mar-14	Gas Laws and Kinetic Theory	Gas Laws and Kinetic Theory	Kinetics	Prac 1 - Even Week Group
3	17-Mar-14	Kinetics	Kinetics	Equilibria	Prac 1 - Odd Week Group
4	24-Mar-14	Equilibria	Equilibria	Acid-Base Equilibria	Prac 2 - Even Week Group
5	31-Mar-14	Acid-Base Equilibria	Buffers, Precipitation, Complex Ion Equilibria	Buffers, Precipitation, Complex Ion Equilibria	Prac 2 - Odd Week Group
6	7-Apr-14	Buffers, Precipitation, Complex Ion Equilibria	Electrochemistry	Electrochemistry	Prac 3 - Even Week Group
	14-Apr-14	Recess	Recess	Recess	Recess
	21-Apr-14	Recess	Recess	Recess	Recess
7	28-Apr-14	Electrochemistry	Mid-Semester Test	Modern Atomic Theory	Prac 3 - Odd Week Group
8	5-May-14	Modern Atomic Theory	Modern Atomic Theory	Chemical Bonding and Molecular Geometry	Prac 4 - Even Week - Group
9	12-May-14	Chemical Bonding and Molecular Geometry	Chemical Bonding and Molecular Geometry	Chemical Bonding and Molecular Geometry	Prac 4 - Odd Week Group
10	19-May-14	Thermochemistry and Chemical Energy	Thermochemistry and Chemical Energy	Thermochemistry and Chemical Energy	Prac 5 - Even Week Group
11	26-May-14	Thermochemistry and Chemical Energy	Liquids and Solids	Transition Metal Compounds	Prac 5 - Odd Week Group
12	2-Jun-14	Transition Metal Compounds	Transition Metal Compounds	Chemistry of some p-block Elements	Prac 6 - Even Week Group
13	9-Jun-14	Reserve/Revision	Reserve/Revision	Reserve/Revision	Prac 6 - Odd Week Group

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

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy 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/

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

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

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

Graduate Capabilities

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

- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret 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 to record experimental results and interpret and communicate conclusions based on observations.

Assessment tasks

- Practicals
- Post-Labs Exercises

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.
- 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.

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 to record experimental results and interpret and communicate conclusions based on observations.
- 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.

- 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.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret 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 to record experimental results and interpret and communicate conclusions based on observations.

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.
- 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.

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

- 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 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 to record experimental results and interpret and communicate conclusions based on observations.
- 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.
- 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.

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.
- At the completion of this unit you will be able to demonstrate the capability to solve chemistry problems and process and interpret 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 to record experimental results and interpret and communicate conclusions based on observations.
- 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.
- 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.

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 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 to record experimental results and interpret and communicate conclusions based on observations.
- 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.

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 to record experimental results and interpret and communicate conclusions based on observations.
- 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

- 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 to 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 to 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 since Last Offering

There have been a number of changes to this unit.

The unit convenor has changes, there has been a number of changes to the practicals, and the text book has changed from Blackman, et. al, *Chemistry*, to Brown et. al., *Chemistry The Central Science: A Broad Perspective*, 3rd edition

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 capture are a suitable 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** lectures 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

When looking at the syllabus for CBMS102 you may conclude that there is a lot of work. However, 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 pass the unit. 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 CBMS102 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 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 an inordinate amount 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, Dr Danny Wong 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. As stated in the Undergraduate Handbook, the number of credit point for each unit reflects the amount of work required, and each credit point has an expectation of approximately 3 hours of work per week (this includes both in class and out of class study).

If you are undertaking an average full-time program of study, *i.e.* 12 credit points, then you should expect to undertake about 36 hours of study per week. Some students may require significantly more 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 CBMS102 from the CBMS102 website through iLearn (ilearn.mq.edu.au). It is not possible to complete the practical component of the unit without these notes.

Lecture 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 CBMS102. 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. 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 www.mq.edu.au/policy/docs/special_consideration/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 as soon as possible to allow due consideration.

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 mid-term exam is missed, there will be no make up exam. In this case, your final exam mark will be used as a proxy for the missed mid-term mark.** 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. Please keep in mind that you must make every effort to attend all on-campus sessions. **If you are likely to have more than one day of absence with the on-campus sessions, you should withdraw and undertake the internal version of CBMS103 in session 2.**

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 and provide formal documentary evidence as soon as possible and contact A/ Prof Joanne 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 up to 5% per weekday for every day late.**

Changes since First Published

Date	Description
07/03/2014	Updated some assignment due dates that had been missed in the first version