

Faculty of Science

School of Chemistry

CHEM1101: Chemistry 1A

Summer School, 2012 | 6 Credit Points | Coordinator: A/Prof Adam Bridgeman (adam.bridgeman@sydney.edu.au)

1 Introduction

This unit of study offers students an integrated approach to the composition of matter, the shapes of molecules, and the physical and chemical processes that occur in chemistry. The emphasis is on the molecular basis of materials and transformations relevant to everyday experience. The laboratory classes develop an appreciation and understanding of the scientific method and include standard research techniques and experimental methodology. The unit carries a credit point value of 6 and consists of approximately 80 hours of teaching. It contains continuous assessment and concludes with an examination.

1.1 Assumed Knowledge and Prohibitions

Students enrolling in this course should have undertaken HSC Chemistry or an equivalent such as the IB (preferably with Higher Level Chemistry) or A-level. Students who have not completed such a Chemistry course should enrol in Fundamentals of Chemistry A (CHEM1001) in semester 1.

2 Course Aims, Learning Objectives and Graduate Attributes

2.1 Course Aims

This course serves as an introduction to chemistry as a quantitative molecular science. Students will gain an understanding of major principles in general chemistry and will acquire manipulative, practical and process skills in the laboratory. In addition, they will become proficient in applying quantitative relationships to predict the physical properties of chemical systems. These latter concepts will provide the foundations of a molecular toolbox that will serve them in any future attempt to understand or use science at a molecular level.

2.2 Learning Outcomes

After successfully completing this unit, you should be able to demonstrate:

1. an understanding of the concepts and language of general and physical chemistry
2. an understanding of atomic theory, structure and bonding, energetics, equilibrium and the processes occurring in solution
3. the ability to perform safe laboratory manipulations and to handle glassware
4. the ability to find and analyse information and judge its reliability and significance
5. the ability to communicate scientific information appropriately both orally and through written work
6. the ability to engage in team and group work for scientific investigations and for the process of learning
7. a sense of responsibility and independence as a learner and as a scientist
8. basic skills in computing, numeracy and data handling

2.3 Graduate Attributes

Graduate Attributes are generic attributes that encompass not only technical knowledge but additional qualities that will equip students to be strong contributing members of professional and social communities in their future careers. The overarching graduate attributes identified by the University relate to a graduate's attitude or stance towards knowledge, towards the world, and towards themselves. These are understood as a combination of five overlapping skills or abilities, the foundations of which are developed as part of specific disciplinary study. For further details please refer to the Science faculty website at:

<http://www.itl.usyd.edu.au/graduateAttributes/facultyGA.cfm?faculty=Science>

Graduate Attributes		Learning Outcomes
A Research and Inquiry		
A1.	Apply scientific knowledge and critical thinking to identify, define and analyse problems, create solutions, evaluate opinions, innovate and improve current practices.	1, 2, 4
A2.	Gather, evaluate and deploy information relevant to a scientific problem.	1, 2, 4, 5
A3.	Design and conduct investigations, or the equivalent, and analyse and interpret the resulting data.	3, 8
A4.	Critically examine the truth and validity in scientific argument and discourse, and evaluate the relative importance of ideas.	4, 6, 7
A5.	Disseminate new knowledge and engage in debate around scientific issues.	1, 2, 5, 6
A6.	Value the importance of continual growth in knowledge and skills, and recognise the rapid, and sometimes major, changes in scientific knowledge and technology.	1, 4
B Information Literacy		
B1.	Use a range of searching tools (such as catalogues and databases) effectively and efficiently to find information.	1, 2, 5, 8
B2.	Access a range of information sources in the science disciplines, for example books, reports, research articles, patents and company standards.	1, 2, 4, 8
B3.	Critically evaluate the reliability and relevance of information in a scientific context.	1, 2, 4, 8
B5.	Use information technology to gather, process, and disseminate scientific information.	4, 8
C Communication		
C1.	Explain and present ideas to different groups of people in plain English.	1, 2, 4, 5
C2.	Write and speak effectively in a range of contexts and for a variety of different audiences and purposes.	5, 8
C3.	Use symbolic and non-verbal communication, such as pictures, icons and symbols as well as body language and facial expressions, effectively.	1, 2, 5, 8
C4.	Present and interpret data or other scientific information using graphs, tables, figures and symbols.	1, 2, 5, 8
C5.	Work as a member of a team, and take individual responsibility within the group for developing and achieving group goals.	1, 2, 3, 6, 7
C6.	Take a leadership role in successfully influencing the activities of a group towards a common goal.	1, 2, 6, 7

D Ethical, Social and Professional Understanding		
D1.	Demonstrate an understanding of the significance and scope of ethical principles, both as a professional scientist and in the broader social context, and a commitment to apply these principles when making decisions.	1, 2, 4, 7
D2.	Appreciate the importance of sustainability and the impact of science within the broader economic, environmental and socio-cultural context.	1, 2, 4, 7
E Personal and Intellectual Autonomy		
E1.	Evaluate personal performance and development, recognise gaps in knowledge and acquire new knowledge independently.	1, 2, 4, 7
E2.	Demonstrate flexibility in adapting to new situations and dealing with uncertainty.	1, 2, 3, 5, 6, 7
E4.	Set achievable and realistic goals and monitor and evaluate progress towards these goals.	1, 2, 7
E5.	Demonstrate openness and curiosity when applying scientific understanding in a wider context.	1, 2, 4, 6, 7

For Learning Outcomes related to specific topics go to:

<http://firstyear.chem.usyd.edu.au/chem1101/learningoutcomes.shtml>.

3 Study Commitment

The current standard work load for a 6 credit point unit of study is 3-7 hours per week of face-to-face teaching contact hours and an additional 6 hours per week of student work of independent study. Below is a breakdown of our expectations for this unit. It should be noted that 'Independent Study' is based on what we believe to be the amount of time a typical student should spend to achieve to pass an item of assessment. Times are a guide only.

In class activities	Hours
Lectures (36 @ 1 hour each)	36
Practicals (9 @ 3 hours each)	27
Tutorials (13 @ 1 hour each)	13
Total	76

Independent Study	Hours
Reading for lectures (36 @ 0.5 hour each)	18
Tutorial assignments (13 @ 1 hour each)	13
Preparation for laboratory work including pre-laboratory quizzes (9 @ 0.5 hours each)	4.5
Revision for tutorial quizzes (3 @ 3 hours each)	9
Revision for mid-course test	3.5
Revision for exam	12
Total	60

Study Tips

You are now in control of your own study strategy, and as an adult learner it is up to you to devise a study plan that best suits you. Many resources are available to assist your learning including online activities, tutorials and support, a range of textbooks and the First Year Chemistry Learning Centre.

- Online resources include ChemCAL, self-learning tests and suggested exam questions for each topic. See 'Course Resources' on the eLearning site for this unit for more details. The discussion board on the eLearning site is regularly monitored by tutors and lecturers.
- Resources for the recommended textbook are available under 'Textbook Resources' on the eLearning site for this unit. Copies of this textbook and many other suitable reference books are available in the SciTech Library.

4 Learning and Teaching Activities

Weekly Schedule

- LECTURES – see the [CHEM1101 website](#) for a full list of available classes
- TUTORIALS – see the [CHEM1101 website](#) for a full list of available classes
- LABORATORIES – see the [CHEM1101 website](#) for a full list of available classes

5 Teaching Staff and Contact Details

Unit Coordinator	Email			
A/Prof Adam Bridgeman	adam.bridgeman@sydney.edu.au			
Teaching Staff	Email	Room	Phone	Note
Dr Adrian George	a.george@chem.usyd.edu.au	224	93514413	Weeks 1 - 3
Dr Jeanette Hurst	j.hurst@chem.usyd.edu.au	242	93513105	Weeks 4 - 6

6 Learning Resources

RECOMMENDED TEXTBOOK

Blackman, Bottle, Schmid, Mocerino and Wile,
Chemistry and SI Chemical Data (package), 2011 (John Wiley) ISBN: 9 78174246 5951

Textbooks can be purchased at the Co-op Bookshop and copies are also on reserve in the SciTech Library. The textbook is a recommended purchase and is not compulsory. Resources provided by the publisher, including a link to their course website, are available under 'Textbook Resources' on the eLearning site for this unit.

7 Assessment Tasks

You are responsible for understanding the University policy regarding assessment and examination, which can be found at http://www.usyd.edu.au/ab/policies/Assess_Exam_Coursework.pdf

Formative and Summative Assessment

Assessment in this unit will be formative (for self assessment and feedback) and summative (for feedback and marks).

7.1 Summative Assessments

Assessment Task	Percentage Mark	Due Date	Learning Outcomes
Tutorial Quiz 1	5	Tuesday Week 2 10 th January 2012	1, 2, 7
Tutorial Quiz 2	5	Tuesday Week 3 17 th January 2012	1, 2, 7
Tutorial Quiz 3	5	Tuesday Week 6 7 th February 2012	1, 2, 7
Mid-course Test	10	Thursday Week 3 19 th January 2012	1, 2, 8
Examination	60	Thursday 16 th February 2012	1, 2, 8
Laboratory	15	Weekly (weeks 1 – 6)	3, 4, 5, 6, 7, 8

Descriptions of Summative Assessments

Tutorial Quizzes

Each quiz involves 10 multiple choice questions and will be held in the tutorial class. A sample quiz is available in the course handbook and this should be consulted for the topics and style of the questions in the quiz.

Mid-Course Test

The test covers the lecture course up for the first 5 days of the course. Full exam papers with model answers are available via 'Course Resources' on the eLearning site for this unit.

Examination

The final examination covers the whole of the lecture course and is made up of approximately 1/3 multiple choice and 2/3 short answer questions. No laboratory work is examinable. Full exam papers with model answers are available via 'Course Resources' on the eLearning site for this unit.

Laboratory

The laboratory course represents 15% of the unit mark. It is assessed through a variety of in-class and online activities. The laboratory course **must** be passed for the unit for the unit to be passed - i.e. a mark of 7.5 / 15 is required. In addition, you must attend 8 out of the 9 experimental session to pass the laboratory course.

Laboratory Attendance and Attitude (3%)

Awarded each week of the laboratory course.

Pre-Laboratory Quizzes (3%)

Available under 'Laboratory Program' on the eLearning site for this unit and to be completed prior to the relevant experiment.

Laboratory Log Book (7%)

Completed during each laboratory session, the log book is a record of observations and hypotheses. See the 'Laboratory Handbook' for more details. Completion of the '[Plagiarism and Academic Honesty](#)' course is required for the log book mark to be recorded.

Laboratory Skills (2%)

Development of key laboratory skills, assessed by your demonstrator during each laboratory session.

7.2 Formative Assessments

Assessment Task	Date Available	Learning Outcomes
ChemCAL Online Tutorials and Other Resources	Always Available	1, 2, 7, 8
Tutorial Assignments	Weekly	1, 2, 7
Suggested Exam Questions	Weekly	1, 2, 7
Tutorial Worksheets	Weekly	1, 2, 5, 6, 7

Descriptions of Formative Assessments

ChemCAL Online Tutorials and Other Resources

A collection of self-assessment modules and other resources for topics from the lecture course. See 'Resources organised week by week' on the eLearning site for this unit or directly at <http://firstyear.chem.usyd.edu.au/chem1101/resources.shtml>

Tutorial Assignments

You should download the weekly tutorial problem sheet and complete it each week before your tutorial. See 'Course resources' on the eLearning site for this unit or directly at http://firstyear.chem.usyd.edu.au/chem1101/tutorial_sheets.shtml

Suggested Exam Questions

Past exam topics organized for each topic of the lecture course. See 'Course resources' on the eLearning site for this unit or directly at http://firstyear.chem.usyd.edu.au/chem1101/exam_questions.shtml

Tutorial Worksheets

Group worksheets covering key examinable concepts from the lecture course. These are provided in hard copy in the course booklet.

7.3 Assessment Grading

Final grades in this unit are awarded at levels of HD (High Distinction), D (Distinction), CR (Credit), P (Pass) and F (Fail) as defined by Academic Board Resolutions: Assessment and Examination of Coursework. Details of Academic Board Resolutions are available on the University's Policy website at http://www.usyd.edu.au/ab/policies/Assess_Exam_Coursework.pdf

Standards for grades in individual assessment tasks and the summative method for obtaining a final mark in the unit will be set out in a marking guide supplied by the unit coordinator. Distributions of merit grades in units of studies offered by Schools in the Faculty of Science are governed by a policy based on norm-referencing. For Junior units of study, the allocated distributions of merit grades (acceptable ranges in brackets) are:

Merit Grades	%HD	%HD + D	%HD + D + CR
Junior	3% (2-5%)	14% (9-20%)	42% (30-55%)

In practice, this means that the number of merit grades (High Distinctions, Distinctions and Credits) is limited by the number of students enrolled in the unit of study, unless a special case can be made. When grades returned by unit executive officers fall outside these guidelines, marks within the unit of study may be scaled to fit the guidelines.

The full Academic Board Resolutions can be found at:

http://www.usyd.edu.au/ab/policies/Assess_Exam_Coursework.pdf

Assessed exercises may not be revised and resubmitted for re-marking. If you wish to appeal an academic decision, you should refer to the University Policy at:

http://www.usyd.edu.au/ab/policies/HESA_Grievance_Procedures.pdf and

http://sydney.edu.au/senate/policies/Ac_Appeals_Rule.pdf

You are responsible for handing in reports on time and attending exams when they are scheduled. Being unaware of due dates and exam dates is NOT a valid excuse for late submission or non-attendance.

8 Learning and Teaching Policies

For full details of applicable university policies and procedures, see the Policies Online site at

<http://sydney.edu.au/policy>

Academic Policies relevant to student assessment, progression and coursework:

- Academic Honesty in Coursework. All students must submit a cover sheet for all assessment work that declares that the work is original and not plagiarised from the work of others. The University regards plagiarism as a form of academic misconduct, and has very strict rules that all students must adhere to. For information see the document defining academic honesty and plagiarism
http://sydney.edu.au/ab/policies/Academic_Honesty_Cwk.pdf
- Coursework assessment and examination policy. The faculty policy is to use standards based assessment for units where grades are returned and criteria based assessment for Pass / Fail only units. Norm referenced assessment will only be used in exceptional circumstances and its use will need to be justified to the Undergraduate Studies Committee. Special consideration for illness or misadventure may be considered when an assessment component is severely affected. This policy gives the details of the information that is required to be submitted along with the appropriate procedures and forms (see link below).
- Special Arrangements for Examination and Assessment. In exceptional circumstances alternate arrangements for exams or assessment can be made. However concessions for outside work arrangements, holidays and travel, sporting and entertainment events will not normally be given. Start by going to the Faculty of Science Webpage, and downloading the 'Special Consideration' pack
http://sydney.edu.au/science/cstudent/ug/forms.shtml#special_consideration
- Student Appeals against Academic Decisions. Students have the right to appeal any academic decision made by a school or the faculty. The appeal must follow the appropriate procedure so that a fair hearing is obtained.

Relevant forms are available on the Faculty policies website at:

<http://sydney.edu.au/science/cstudent/ug/forms.shtml>