

## UNIT OUTLINE

<b>Semester and Year:</b>	<b>2<sup>nd</sup> SEMESTER 2009</b>
<b>Lecturer-in-charge:</b>	<b>Dr Danny Wong</b>
<b>[Prerequisites / Corequisites:]</b>	<b>NONE</b>

Students in this unit should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult Dr Danny Wong.

### ABOUT THIS UNIT

Many aspects of science aim to connect observations, either in the laboratory or in the everyday world, with chemical principles. CBMS101 concentrates on physical, inorganic and general chemistry. It is suitable for students with little or no HSC chemistry, although a high school chemistry background is strongly recommended.

The unit is designed to help science students gain chemical insight in terms of atoms, molecules and energy, and develop analytical and quantitative skills. In conjunction with CBMS103, this unit provides both a general chemistry background for students majoring in other sciences and a firm foundation for students intending to major in chemistry.

### LEARNING OBJECTIVES

The learning objectives of this unit are:

- to achieve fundamental understanding of general chemical principles applicable to chemistry and other science disciplines, particularly the role of chemistry in the modern society;
- to develop some aspects of generic skills including the analytical capability in solving chemical problems, processing and interpretation of chemical data, and acquaintance of information technology;
- to acquire basic laboratory skills and to familiarise with general laboratory safety issues;
- to acquire some interpersonal skills through teamwork and communication during laboratory sessions and tutorials.

### TEACHING STAFF

Dr Danny Wong is the lecturer-in-charge for this unit. All students enrolled in the external offering of CBMS101 in Second Semester should consult Dr Danny Wong (phone (02) 9850 8300, room F7B 235, e-mail: [Danny.Wong@mq.edu.au](mailto:Danny.Wong@mq.edu.au)) if you have any administrative or organisational problems.

It is expected that from time to time students will need individual help with answers to specific questions about the study material or with particular exercises. In the Department of Chemistry & Biomolecular Sciences, we are always willing to make time available to help individual students. The only provisos are that you must first have made a genuine effort to understand the work yourself and that your problems are specific. It is advisable to phone for an appointment in advance. Most staff have voice-mail phone answering, so please leave a message if the person you want is unavailable.

We hope that you find CBMS101 interesting and stimulating.

### TECHNOLOGY USED

It is important that you have a scientific calculator as hand-held calculators will be used 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. General use computers are provided by the University, but it would be advantageous to have your own computer and internet access.

### CLASSES

CBMS101 is a 3-credit-point half-year unit. For students enrolled in the internal offering, the unit will require students to invest an average of at least 9 hours' work per week; three lectures a week, one 1-hour tutorial and a four-hour laboratory session every second week plus 4 hours per week of private study. Students with weak chemistry backgrounds will probably need to spend significantly more time than this. **Students enrolled in the external offering of the unit will be expected to invest an equivalent amount of time of private study.** New material and new concepts are introduced in fast succession. **Thus, in order to successfully complete this unit, students will need to work hard, consistently and continuously throughout the semester.**

### REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

The prescribed texts are:

T.L.Brown, H.E.LeMay, Jr, B.E.Bursten, S.Langford, D.Sagatys, N.Duffy, *Chemistry The Central Science: A Broad Perspective*, Pearson Prentice Hall, 2007. [ISBN: 9780 7339 7459 5]

and

G. Aylward and T. Findlay, *SI Chemical Data (6th Ed.)*, John Wiley and Sons, 2008. [ISBN: 978 0 470 81638 7]

You are expected to have a copy of each book. *SI Chemical Data* contains important safety information and must be brought to every laboratory session. The brief lecture summaries and the lecture overheads discussed below are of little value without the text. You are also required to download *Laboratory Notes for CBMS101* from the CBMS101 website. It is not possible to meet the requirements of the unit without a copy of these notes.

Lecture overheads can be viewed or printed from the CBMS101 World Wide Web page using any web browser such as Firefox, Internet Explorer or Safari. Similarly, audio lecture recordings can be downloaded from the same web page. The URL is:

<http://www.cbms.mq.edu.au/~cbms101x>

If necessary, the following two textbooks are recommended as useful references and they are available in the Co-operative Bookshop and the Library:

- A.Blackman, S.Bottle, S.Schmid, M.Mocerino, U.Wille, J.E.Brady, F.Senese, W.H.Brown, T.Poon, J.Olmsted III, G.M.Williams *Chemistry*, John Wiley & Sons Australia, Ltd, 2008.
- N.J.Tro, *Chemistry A Molecular Approach*, Pearson Prentice Hall, 2008.

Some basic high school level mathematical skills would also be useful in CBMS101. If you need to refresh basic mathematical skills, you may like to obtain a copy of

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

which is available in the Co-operative Bookshop. Limited copies of this book are available in the Library.

#### UNIT WEB PAGE

Various types of material are available *via* the Internet. The CBMS101 Website will be used for the posting of important messages. You may check on your marks as the unit proceeds. Copies of many of the overheads to be presented in lectures are also available *via* the Web.

If you have off-campus Internet access, simply start your web browser such as Firefox, Internet Explorer or Safari and proceed as below. You may also use the computers on Level 1 in the University Library. Once the browser program is running, type in the URL of the CHEM101 web page that is:

*<http://www.cbms.mq.edu.au/~cbms101x>*

Clicking on the Login button will produce a box in which you must type a User Name 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 did not receive this letter, or you have lost it, you can print yourself a new one from the URL

*[http://www.ocs.mq.edu.au/stdgen/self\\_reprint.html](http://www.ocs.mq.edu.au/stdgen/self_reprint.html)*

If you are experiencing difficulties in getting your reprint or your password, please contact the StudentIT Desk (telephone: 9850-6500) on Level 1 of the Library.

#### Learning objectives and outcomes

The learning outcomes of this unit are:

- to achieve fundamental understanding of general chemical principles applicable to chemistry and other science disciplines, particularly the role of chemistry in modern society relating to current issues such as global warming and everyday life experiences;
- to foster the development of graduate capabilities ranging from chemistry specific skills including the analytical capability in solving chemical problems, processing and

interpretation of chemical data, and acquaintance of information technology to social and environmental awareness;

- to acquire basic laboratory skills and to familiarise with general laboratory safety issues;
- to acquire some interpersonal skills through teamwork and communication during laboratory sessions and tutorials.

In addition to the discipline-based learning objectives, all academic programs at Macquarie seek to develop students' graduate capabilities in a range of areas. One of the aims of this unit is that students develop their skills in the following:

- ✓ Basic skills of time management and organisation;
- ✓ Foundation skills of literacy, numeracy and information technology;
- ✓ Self-awareness and interpersonal skills;
- ✓ Communication skills;
- ✓ Critical analysis skills;
- ✓ Problem-solving skills;
- ✓ Multi-tasking skills.

## TEACHING AND LEARNING STRATEGY

### Syllabus

The syllabus for CBMS101 detailing topics to be covered and textbook sections to be studied is set out on separate sheets. Consult this syllabus frequently to be sure that you have covered all the required material.

### Unit Requirements

In order to complete this unit you must:

- (a) Participate in **all** laboratory sessions and submit laboratory reports by the designated dates.
- (b) Submit answers to the computer tutorial exercises.
- (c) Attempt the mid-semester test at the normal lecture time on **Saturday, 26 September 2009\***
- (d) Sit a final examination of three hours duration.

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 Danny Wong. If you miss more than one laboratory session through illness or misadventure, you should request withdrawal without penalty. If you miss any laboratory session without adequate evidence of illness or misadventure, you may be awarded an FA grade.

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\* Please see letter attached to "Important Dates, On-campus Timetable, Study Plan and Mailing Schedule".

## Unit Expectations

In addition to the formal requirements for the unit, there are other actions you should take to have a reasonable chance of success. They are the same things that you need to do in order to demonstrate that you have been performing satisfactorily up to the time of any request for special consideration.

The unit 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 reasonable competence in all laboratory preparation exercises before each class
- demonstrate reasonable competence in the post-laboratory exercises submitted by the due dates
- spend an average of no less than 6 hours per week private study in addition to class contact

***If you fail to meet the formal unit requirements, you may be withdrawn from the unit, but if you fail to meet these expectations, the probability of obtaining a passing grade will be greatly reduced.***

## Lectures

As indicated above, copies of many of the overhead transparencies to be presented in lectures will be available on the CBMS101x Web pages. They will be in PDF format so you can view them only if your computer has a Version 4 or later Adobe Acrobat Reader (can be downloaded from the CBMS101x home page). During on-campus sessions, you may wish to take printed copies of these transparencies to your lectures so you can spend most of the lecture time listening to the presenter and less on transcribing notes. But be warned! You may be tempted to believe that reading the overheads can substitute for attendance at the lectures. *Many overheads make little sense without the accompanying discussion. Moreover, not all overheads used in lectures are necessarily included in the material that is placed on the Web.*

## Tutorials

Tutorial work in CBMS101 takes two forms: computer-based exercises (on which assessment is based) and regular tutorial classes (which all students are strongly advised to attend).

A set of 6 computerised assignments aimed at the development of problem solving skills is an important part of the CBMS101 unit. While working through problems in these assignments, you will receive an immediate indication of whether your answers are right or wrong; and you will be provided with a variety of strategies for finding out where you went wrong.

To prepare for your computerised assignments, you must have already attempted as many as possible of the textbook questions listed on the tutorial sheets to be provided. During each tutorial class you should ask questions about any problem that caused you difficulties, but in the absence of questions, your tutor will ask the class to work through the examples listed on the tutorial sheets. You will get much more benefit from the tutorials if you have prepared in advance.

## Laboratory Work

Details of the laboratory work are contained in the notes available on the web. You will be scheduled to complete a total of six experiments.

The Laboratory Notes must be read and some simple preparatory exercises completed *before* you attend the laboratory session. The answers to the exercises are to be written on the sheets of the Data Section at the end of each set of Experimental Notes.

*The laboratory work must be completed and handed in by the designated dates in the document entitled "Important Dates, On-campus Timetable, Study Plan and Mailing Schedule".* Post-laboratory exercises are provided for you to gain bonus marks, and they should be submitted together with your main reports.

Both the laboratory report and the completed post-laboratory exercises are to be placed in an assignment folder provided to you by the Open Education Centre. You should then mail the package to the Open Education Centre such that they arrive at Macquarie University by the dates indicated in a document entitled "Important Dates, On-Campus Timetable, Study Plan and Mailing Schedule". While comments may be provided for your guidance, your bonus mark out of 0.5 will reflect the quality of your answers.

## Computer Tutorial Exercises

You are expected to undertake web-based exercises at regular intervals during the course of CBMS101. These exercises are to be performed on-line *via* the website of the publishing company of your textbook by Brown *et al.* The questions you will be answering are randomly generated and are unique to you. While it is possible to print out your assignments to work on them off-line, ultimately you need to enter the answers to your questions online, therefore you will need to have access to a computer with internet access. The computers on Level 1 of the Library are available for your use should you not have a computer of your own.

The exercises are divided into six assignments, each covering approximately two weeks' work. The problems are divided into two levels of difficulty. By student request, deadlines will be set for submitting the exercises. Please refer to a document entitled "Important Dates, On-Campus Timetable, Study Plan and Mailing Schedule" for the exact due date and time for each assignment. Note that 20% of mark will be deducted for every one late day in completing each assignment. Furthermore, each assignment will be closed 7 days after the due date.

To access your exercises, you will need to use your own unique access code that accompanies the textbook you have purchased. Please follow the steps below:

1. Go to [www.masteringchemistry.com](http://www.masteringchemistry.com).
2. In the REGISTER box select NEW STUDENTS (upper left corner)
3. Click YES, I have an access code
4. ACCEPT the license agreement
5. Select YES, NO, or NOT SURE regarding a PEARSON EDUCATION account.  
\*\*Hint: have you previously registered for Mastering or a MyLabs product?
6. Enter the access code that was included with your NEW textbook purchased from the campus bookshop  
**Example: USMCMU-MEXXY-EATER-SLOAN-PEEPS**
7. Continue to provide personal information as prompted
8. Once registration is complete you will receive a Confirmation Screen with your information. This information will also be emailed to you.

Please contact Dr Danny Wong if you have any access code problems.

## **Logging into YOUR class**

1. Return to [www.masteringchemistry.com](http://www.masteringchemistry.com)
2. LOGIN using the Login Name and Password you just created
3. When prompted, insert the following COURSE ID: **MCWONG28420**
4. If you are not prompted for a courseID, you may need to click JOIN COURSE on the upper left side of YOUR MasteringChemistry home page

## **Support and More Information:**

For Mastering Support please visit [www.masteringchemistry.com/support](http://www.masteringchemistry.com/support)

- Here you will find links to:
  - Difficulty with registration
  - Getting Started with MasteringChemistry (a handy, one page document)
  - How To Use MasteringChemistry video tours
- Visit <http://247pearsoned.custhelp.com/> for LIVE! chat support. Email technical support is available 24/7.
- Please try the support link first, if they can not or do not provide help within 48 hours please feel free to call Pearson Consultant, Terence Sitiabudi:
  - phone: 0439 417 826
  - E-mail: [Terence.sitiabudi@pearson.com.au](mailto:Terence.sitiabudi@pearson.com.au)

## **RELATIONSHIP BETWEEN ASSESSMENT AND LEARNING OUTCOMES**

### **Assessment**

The assessment marks have been divided into two components. The first category is included for the purpose of assessing candidates based on individual skill and understanding. The laboratory reports, computerised assignments, mid-semester test and final examination fall into this category.

The second category is included to help you develop skills and understanding. We award bonus marks for extra work. The post-laboratory exercises fall into this category. Your demonstrator will award each set of post-laboratory exercises up to 0.5 bonus marks if it is submitted on time and is satisfactory.

The relative weighting for the various components of the unit are:

(a) laboratory work (experimental competence, understanding of theory, quality of reports)	15%
(b) post-laboratory exercises	3% (bonus)
(c) computerised assignments	15%
(d) mid-semester test	15%
(e) final examination	55%

Assessment will be based primarily on the total score aggregated as above, but, in addition, a satisfactory level of achievement in the final exam and the completion of at least 5 experiments is required in order to pass the unit.

The University Examination period in Second Half Year 2009 is from 18 November to 4 December.

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations.

<http://www.timetables.mq.edu.au/exam>

The only exception to sitting an examination at the designated time is through documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at <http://www.reg.mq.edu.au/Forms/APSCon.pdf>

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester, that is the final day of the official examination period.

### **SOME SUGGESTED STUDY METHODS**

“Introductory Chemistry A” is considered by many students to be a demanding unit. When you look at the syllabus, you will probably conclude that there is a lot of work assigned, perhaps significantly more than that assigned in some of your other units. Such a conclusion is correct! This unit will most likely be considerably more demanding than many of your other units. We expect that you will spend an average of at least 6 hours of private study per week in this unit. If you do your work in a timely and conscientious way, perhaps following the study methods suggested below, you should do fine.

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. This unit in introductory chemistry moves along at a fast pace and you need to stay on top of the materials at all times. Experience shows us that students who fall far behind encounter severe difficulties and rarely catch up again.

If, despite the stellar performances of the lecturer and others and even after careful and extensive studying on your own, you do realise that some difficulties remain with understanding the unit material, then seek help early! It is often beneficial to study with a friend in the unit. Dr Danny Wong is always happy to assist you as long as you take the initiative.

Some suggested guides in studying CBMS101 are listed below.

- 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 diligent (and not so diligent) students fall into is thinking that just because they understand (or think they understand) the solution to the problem, they will be able to do a similar problem in an examination. Note that in your online assignments and examinations, you are alone without any solution.

- 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 each chapter at <http://www.masteringchemistry.com>. Make use of them!
- Do not hesitate to seek help from Dr Danny Wong 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.

## PLAGIARISM

The University defines plagiarism as: "Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at: <http://www.student.mq.edu.au/plagiarism/>

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

## UNIVERSITY POLICY ON GRADING

Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG).

On occasion your raw mark for a unit (i.e., the total of your marks for each assessment item) may not be the same as the SNG that you receive. Under the Senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should achieve similar results.

It is important that you realise that the policy does not require that a minimum number of students is to be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark.

For an explanation of the policy see  
<http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc> or  
<http://www.mq.edu.au/senate/MQUonly/Issues/detailedguidelines.doc>.

## **STUDENT SUPPORT SERVICES**

### **Video-Assisted Learning (VAL)**

There are numerous video films in the library, which are very helpful for revision and explaining chemical concepts. These can be found in both the audiovisual and curriculum sections of the library (3rd floor) under 'QD'. Consult the library catalogue by going into the "All Categories" part of the Main Menu and type 'videorecording and chemistry'.

### **Numeracy Centre**

Students, who need help with revision of simple mathematical concepts required in this unit, can receive remedial assistance from the Numeracy Centre on campus. Topics such as simple proportions, logarithms and manipulation of simple equations are examples of topics offered by the Centre. Contact the Numeracy Centre (C5A 225) on 9850 8924.

Macquarie University provides a range of Academic Student Support Services. Some examples are Study Skills Workshops, Writing Gateway, library tours and IT training. Details of these services can be accessed at <http://www.student.mq.edu.au>.

## **EFFECT OF EXCESSIVE PAID WORK AND OTHER ACTIVITIES ON STUDENT PROGRESS AND SUCCESS**

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 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 36 hours of study per week. 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 semester or reducing the number of units you undertake.

We wish you well in CBMS101 and we hope you will enjoy the unit in Second Semester!

Dr Danny Wong  
Lecturer-in-charge, CBMS101.X2