



UNIVERSITY
OF TASMANIA

School of Chemistry

Faculty of Science, Engineering and Technology

KRA102
Chemistry 1B
Semester 2

2009

Unit Outline

Dr Trevor W Lewis

Unit Co-ordinator

CRICOS Provider Code: 00586B

Contact details

Unit coordinator/lecturer: Dr Trevor W Lewis
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Unit summary

Unit code	KRA102
Unit title	Chemistry 1B
Unit description	This is a Semester 2 unit conducted, along with KRA 101, Chemistry 1A, as an introduction to the fundamentals of chemistry. Two lectures per week are allocated to Organic Chemistry and one lecture per week to Physical Chemistry. Compulsory 3 hour practicals are run during Weeks 3 to 11 inclusive to emphasise critical aspects of the lecture course. A one hour tutorial session is offered each week from Weeks 2 to 13.
Teaching staff	Dr Susan Turland (Organic Chemistry) Dr Trevor Lewis (Physical Chemistry and Unit Coordinator)
Campus & mode	Launceston Campus by face to face teaching
Unit weight	12.5 %
Teaching pattern	Semester 2 Unit 3 x 1 hr lectures, 1 x 3 hr practical and 1 x 1 hr tutorial per week
Prerequisites	TCE Chemistry Level C or equivalent or KJC162 – Introduction to Biochemistry
Mutual exclusions	KJC161, KJC162
Assessment	Examinations 60% Tests 20% Practicals 20%
Required texts, etc	Brown, LeMay, Bursten, Langford, Sagatys and Duffy; <i>Chemistry – the central science: a broad perspective</i> , Pearson Prentice Hall, 2007.
Recommended reading	S1 Chemical Data, Aylward and Findlay, 5 th edition, Wiley, 2002.

Other publications

Lab Manuals, Lab Diaries and Physical Chemistry Lecture Notes will be available through the University Printery, situated next to the Bookshop. Organic Chemistry lecture notes will be made available during the semester.

Special Equipment

- Laboratory Coat.
- Safety Glasses.

Learning outcomes

On successful completion of this unit, students should be able to:

- (i) Demonstrate an understanding of general principles governing electrochemistry and apply these to corrosion, corrosion protection, batteries and electrolysis.
- (ii) Demonstrate an understanding and practical knowledge of thermochemistry, chemical thermodynamics and chemical kinetics and be able to use these to determine if a chemical reaction will occur and how fast it will occur.
- (iii) Demonstrate a theoretical and practical knowledge of the occurrence, synthesis, properties and reactions of the main classes of organic compounds.
- (iv) Demonstrate the relationships between, and the interconversion of, the various types of functional groups, and an understanding of substitution and addition reaction mechanisms.

Details of teaching arrangements

Unit schedule

Week	Date Starting	Monday 13.10 – 14.00 LT 7 Lecture	Wednesday 11.00 – 11.50 LT 7 Lecture	Wednesday 16.10 – 17.00 LT 7 Lecture	Wednesday 12.00–12.50 LT8 Tutorial	Prac
1	13 July	TWL	SAT	SAT	No Tutorial	-
2	20 July	TWL	SAT	SAT	SAT	-
3	27 July	TWL	SAT	SAT	SAT	Prac 1
4	3 Aug	TWL	SAT	SAT	TWL	Prac 2
5	10 Aug	TWL	SAT	SAT	SAT	Prac 3
6	17 Aug	TWL	SAT	SAT	TWL	-
7	24 Aug	Test	SAT	SAT	SAT	Prac 4
Semester Break 31st Aug – 4th Sept inclusive						
8	7 Sept	TWL	SAT	SAT	SAT	Prac 5
9	14 Sept	TWL	SAT	SAT	TWL	Prac 6**
10	21 Sept	TWL	SAT	SAT	SAT	Prac 7
11	28 Sept	TWL	SAT	Test	-	-
12	5 Oct	TWL	SAT	SAT	SAT	Prac 8
13	12 Oct	TWL	SAT	SAT	TWL	-

SAT: Dr Susan Turland

TWL: Dr Trevor Lewis

**** Prac 6 is a full written report and is due in at the end of Prac 8.**

Note : This gives you three weeks to write up the full report, though this three weeks also includes the second Test.

Content

Organic Chemistry

- Bonding of Carbon: bond cleavages, classification of reagents.
- Nomenclature: IUPAC rules for alkanes, alkenes, alkynes, dienes, cyclic compound, alcohols, aldehydes, ketones, ethers, acids and acid derivatives and amines.
- Alkanes: Physical properties, preparations, reactions.
- Alkenes: Bonding, preparation, electrophilic addition reactions, Markovnikov's rule, anti-Markovnikov addition, oxidation.
- Alkynes: Bonding, preparation and reactions, acidity of terminal alkynes.
- Dienes: 1,4 addition and resonance.
- Aromatics: Bonding, nomenclature, electrophilic substitution reactions, substituent effects, alkyl benzenes.
- Optical isomerism: Asymmetric carbon atom and configurations.
- Alcohols and Phenols: physical properties, acidity, preparation of alcohols, nucleophilic substitution, S_N1 and S_N2 reactions, preparation of phenols, reactions of alcohols and phenols.
- Ethers: Preparation, Williamson synthesis and cleavage reactions.
- Organic Halogen compounds: preparation and reactions, substitution versus elimination, Grignard formation.
- Aldehydes and ketones: bonding, preparations, nucleophilic addition reactions, oxidation reduction, acidity of alpha hydrogens.
- Carboxylic acids and derivatives: acidity, preparation of carboxylic acids and interconversions of acids, acid halides, esters and amides.
- Amines: bonding, basicity, preparation, reactions, diazonium ions and their reactions.
- Biological applications.

Physical Chemistry

- Thermochemistry: First Law of Thermochemistry, Enthalpy, Heat Capacity and Specific Heat, Calorimetry, Hess's Law, Enthalpies of Reaction and Formation, Foods and Fuels
- Thermodynamics: Spontaneous Chemical Reactions, Entropy, the Second Law of Thermodynamics, Gibbs Free Energy
- Chemical Kinetics: Reaction rates, Concentration and Rate, Temperature and Rate, the Arrhenius Equation, Activation Energy, Catalysis
- Electrochemistry: Oxidation and Reduction Reactions, Balancing Redox Equations, Voltaic and Electrolytic Cells, the Nernst Equation, Batteries and Fuel Cells, Corrosion, Electrolysis.

Occupational health and safety (OH&S)

The University is committed to providing a safe and secure teaching and learning environment. In addition to specific requirements of this unit you should refer to the University's policy at: http://www.admin.utas.edu.au/hr/ohs/pol_proc/ohs.pdf

Safety rules for work in a chemical laboratory will be strictly enforced. General OH&S information related to a chemical laboratory will be given during the first laboratory session of each semester and in the Laboratory Manual. Specific information related to an individual practical will be given at the start of that practical.

Students will not be allowed to commence laboratory work unless they are wearing:
safety glasses or goggles,
a laboratory coat,
and enclosed shoes.

Learning expectations and strategies

Expectations

The University is committed to high standards of professional conduct in all activities, and holds its commitment and responsibilities to its students as being of paramount importance. Likewise, it holds expectations about the responsibilities students have as they pursue their studies within the special environment the University offers.

The University's Code of Conduct for Teaching and Learning states:

Students are expected to participate actively and positively in the teaching/learning environment. They must attend classes when and as required, strive to maintain steady progress within the subject or unit framework, comply with workload expectations, and submit required work on time.

Learning strategies

If you need assistance in preparing for study please refer to your tutor or lecturer. For additional information refer to the Learning Development website :
<http://www.utas.edu.au/learndev/>

If you will be using WebCT for the first time and would like some information on how to use WebCT refer to the following guide:
http://www.utas.edu.au/coursesonline/docs/using_webct.pdf

Assessment details

Assessment task 1

Task description	Laboratory reports
Task length	Write-up of each 8 x 3 hr practical session
Assessment criteria / guidelines	Marked on accuracy and precision in the lab and competence in chemical calculations, as well as answers to pre-lab questions and questions related to content of prac. Answers to a short quiz on the material covered in the prac will also be assessed and the marks included in the mark for the prac.
Date due	At the end of each prac session, with the exception of Expt 5 (to be handed in the following week after melting point and yield determination) and Expt 6 (the full written report report, which will be due three weeks after the prac session).

Quizzes and final examinations

Description / conditions	<p>Two quizzes will be conducted each semester during a normal lecture timeslot. These will be held in Weeks 7 and 11 this semester.</p> <p>One 3 hr examination will be conducted at the end of Semester 2: two thirds of this examination will be on Organic Chemistry and one third on Physical Chemistry.</p> <p>In each case the student may take only writing materials and a calculator into the quiz/exam venue.</p>
Date	The final exam is conducted by the University Registrar in the formal examination period. See the <i>Current Students</i> homepage on the University's website.

Specific attendance/performance requirements

Attendance at, and satisfactory performance (ie a mark of >50%) in at least 75% of the practicals is essential to be considered for a pass in this unit.

Furthermore, a passing grade (50% or more) for the overall examination mark as well as the practical component is mandatory for a passing grade in this unit.

How your final result is determined

The final mark for the unit consists of three components: Examinations, Quizzes and Practical. Their contribution to the final mark is given below:

Examinations	60%
Tests	20%
Practicals	20%

Each of the sub-disciplines in this Semester contributes to the final exam mark (Organic Chemistry 40%, Physical Chemistry 20%).

Grades will be awarded based on your overall mark as follows:
Pass 50 – 59% overall, Credit 60 – 69% overall, Distinction 70 – 79 % overall, High distinction 80 – 100% overall. It is mandatory that you achieve a passing grade (50% or more) for the overall examination mark as well as the practical component to pass (or higher) this unit.

Requests for extensions

Any case for an extension of deadline for the submission of prac reports based on extenuating circumstances (such as a medical condition) must be made by the student **before** the due submission date.

It is important to note that the two tests each semester will be part of your continual assessment for this subject and, hence, are compulsory and that there is **no mechanism for early, late or repeat tests** to be run.

Penalties

A penalty of 10% of the assessed mark will be imposed for each working day that a laboratory report is late. Work submitted more than 10 working days late will not be marked.

Academic referencing

In your written work you will need to support your ideas by referring to scholarly literature. It is important that you understand how to correctly refer to the work of others and maintain academic integrity. Failure to appropriately acknowledge the ideas of others constitutes academic dishonesty (plagiarism), a matter considered by the University of Tasmania as a serious offence.

For information on presentation of assignments, including referencing styles:

<http://www.utas.edu.au/library/assist/gpoa/gpoa.html>

Please read and be guided by the following statement on plagiarism. Should you require clarification please see your unit coordinator or lecturer.

Plagiarism

Plagiarism is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own; for example, using an author's words without putting them in quotation marks and citing the source, using an author's ideas without proper acknowledgment and citation, copying another student's work.

If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor for relevant referencing guidelines, and the academic integrity resources on the web at <http://www.utas.edu.au/tl/supporting/academicintegrity/index.html>. The intentional copying of someone else's work as one's own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see <http://www.utas.edu.au/universitycouncil/legislation/>

The University reserves the right to submit assignments to plagiarism detection software, and might then retain a copy of the assignment on its database for the purpose of future plagiarism checking.

For further information on this statement and general referencing guidelines, see <http://www.utas.edu.au/plagiarism/>

Further information and assistance

If you are experiencing difficulties with your studies or assignments, have personal or life planning issues, disability or illness which may affect your course of study, you are advised to raise these with your lecturer in the first instance.

There is a range of University-wide support services available to you including Student Services, International Services and Learning Development. Please refer to the *Current Students* homepage at: <http://www.utas.edu.au/students/>

Should you require assistance in accessing the Library visit their website for more information at <http://www.utas.edu.au/library/>

The NEXUS Journal



nexus: journal of undergraduate science, engineering, and technology is published annually and contains the work of undergraduates. This unit contains assignments that are suitable for submission to the journal. For more information, ask your lecturer, and see <http://www.utas.edu.au/scieng/nexus>.

WITHDRAWAL AFTER CENSUS DATES

Students who are unable to complete a unit need to lodge a request to withdraw from that unit at the Student Centre. The type of withdrawal granted will depend on the date the application is lodged. Late withdrawals may result in the student still being liable for HECS fees for the unit. Withdrawal requests lodged late in the semester may also result in the student being deemed as failing that unit.