Course Outline

CHEM1041/ CHEM1061

Chemistry 1B: Elements, Compounds and Life

School of Chemistry

Faculty of Science

Term 2, 2021

1. Staff

Position	Name	Email	Contact Details
Course Convenor	Shannan Maisey	s.maisey@unsw.edu.au	
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Lecturer (weeks 7–10)	Albert Fahrenbach	a.fahrenbach@unsw.edu.au	

2. Course information

Units of credit: 6

Pre-requisite(s): CHEM1031 or Chem1051 (or equivalent)

Total course contact hours: 72

2.1 Course summary

This course deals with a range of fundamental concepts that can be used to explain various phenomena in chemistry, biology and material science. It enables you to further develop your knowledge of Chemistry and probes a diverse range of molecules and their reactions, focusing on applications such as drug development, functional materials, environmental chemistry, and renewable energies.

A key part of chemistry is to study the speed of chemical reactions providing a strong foundation for material covered later in the course. The course introduces modern structure determination methods and the concepts of stereochemistry, which are important in understanding the shape and structure of chemicals. The next section of the course provides an introduction to modern inorganic chemistry, with a focus on the chemistry of transition metals. Transition metal compounds, d-element electron configuration and coordination complex formation are all explored. The final section of the course deals with the chemistry of carbon-containing compounds and provides an introduction to the field by emphasising the reaction mechanisms that provide insight into how reactions of these molecules proceed. You will be introduced to a range of chemistry that enables the preparation of new molecules starting from readily available materials. The course concludes with by exploring how the chemistry learnt in Chemistry 1A and Chemistry 1B can is applied in the development of molecular machines.

2.2 Course aims

This course builds on the knowledge gained in the earlier course Chemistry 1A. It aims to give a thorough grounding in chemical principles that underpin much of chemistry and biochemistry, particularly chemical kinetics, inorganic and organic chemistry. Stereochemical aspects of molecules as three-dimensional entities are explored, and modern methods of structural determination. The thermochemistry and equilibrium concepts covered earlier are further illustrated in inorganic and transition metal chemistry and the study of chemical kinetics. Major areas of organic chemistry are addressed: functional group chemistry, stereochemistry and symbolism in reaction descriptions. The laboratory component of the course equips you with the necessary skills to safely handle chemicals and Laboratory equipment, perform accurate measurements, meaningful analyses, and to manipulate data.

2.3 Course learning outcomes (CLO)

At the successful completion of this course you (the student) should be able to:

1. Apply the language of chemistry to the naming and formulae of chemical substances and to chemical equations.
2. Perform calculations to quantify substances relating to chemical reactions.
3. Apply theory and laws to predict properties and behaviour of chemical substances.
4. Demonstrate proficiency in defined core chemistry laboratory skills by safely investigating chemical reactions in first-hand scientific investigations.
5. Gather, analyse, and interpret data from first-hand scientific investigations to draw valid conclusions.

2.4 Relationship between course and program learning outcomes and assessments

CLO	CLO Statement	Program Learning Outcome (PLO)	Related Tasks & Assessment
CLO 1	Apply theory and laws to predict properties and behaviour of chemical substances.	Demonstrate confidence and skill in approaching problems and in treating both qualitative and quantitative data. Develop the ability and disposition to think logically and communicate clearly by written and oral means. Demonstrate an understanding of the significance of science and technology in modern society.	Revision Quizzes and Tests Final Exam Laboratory Practicals
CLO 2	Predict the stereochemistry of molecular structures and analyse spectral data to determine molecular structure.	Develop the habit of seeking and recognising relationships between phenomena and theories. Develop the ability and disposition to think logically.	Revision Quizzes and Tests Final Exam Laboratory Practicals
CLO 3	Apply your knowledge of organic functional groups to predict the products of chemical reactions of carbon compounds.	Develop the habit of seeking and recognising relationships between phenomena, principles, theories, conceptual frameworks and problems.	Revision Quizzes and Tests Final Exam Laboratory Practicals
CLO 4	Demonstrate proficiency in defined core chemistry laboratory skills by safely investigating chemical reactions in first-hand scientific investigations.	Apply a working knowledge of fundamental scientific principles, methods of investigation, and an appreciation for objectivity and precision. Develop confidence and skill in approaching problems and in treating both qualitative and quantitative data.	Laboratory Practicals
CLO 5	Gather, analyse, and interpret data from first-hand scientific investigations to draw valid conclusions.	Apply a working knowledge of fundamental scientific principles, methods of investigation, and an appreciation for objectivity and precision. Apply curiosity, imagination, and speculation to solving problems, constructing hypotheses, and designing experiments. Develop the ability and disposition to think logically and communicate clearly by written and oral means.	Laboratory Practicals

2.5 Course syllabus

The syllabus is delivered through a series of interlinked topics building on concepts introduced in Chemistry 1A.

2.5.1 Assumed Knowledge*[1]

1. Electron configurations of atoms and ions, atomic orbital types and shapes.
2. Chemical bonding types and molecular geometries and shapes.
3. The fundamental principle of spectroscopy is that molecules can be promoted to an excited state by absorbing energy.
4. Nomenclature of organic structures.
5. Structural drawings (planar vs 3D).
6. Determine the empirical formula, molecular formula, and degrees of unsaturation from elemental analysis.
7. Collision theory and factors that affect rates of reactions.
8. Lewis structures and nomenclature of alkanes, alkenes, alcohols, aldehydes, ketones, amines, amides, alkyl halides, benzene.

2.5.2 Syllabus

Inorganic Chemistry I – Transition metal complexes

(Blackman Ch 12, 13, 14)

- For a given metal-ligand complex determine the oxidation state, d electron count of the central metal and using the coordination number identify the likely simple shape of the compound.
- Link the concept of 'stability' to equilibrium and thermodynamics and use this to rationalise the chelate effect for multidentate complexes. Compare and rank the relative stabilities of metal complexes based on Z_{eff} and ligand denticity and identify how these phenomena can be applied in real world contexts.

Inorganic Chemistry II – Crystal field theory, colour and magnetism

(Blackman Ch 12, 13, 14)

- Explain, using d orbital energy diagrams and the spectrochemical series of ligands how crystal field theory can be applied to predict the number of unpaired d electrons in the central metal atom of a given octahedral complex. Predict if the complex is high spin or low spin, paramagnetic or diamagnetic, and if the complex is likely to be coloured.
- Predict the magnetic moment of a metal-ligand complex and describe how magnetism can be used to confirm the number of unpaired d electrons in a metal-ligand complex.
- Describe the role played by transition metals in biology such as in photosynthesis, enzymes, transport proteins, and redox processes. i.e. facilitating redox processes, catalysing bond-forming/breaking reactions etc.

*[1] This assumed knowledge will be revised throughout the course but will not be the main focus of the lecture and tutorial content delivered.

Isomerism and Stereochemistry

(Blackman Ch 5, 17)

- Recognise different types of isomeric relationships between molecules including structural isomers and stereoisomers (enantiomers and diastereoisomers) and the impact this has on their physical and reactive properties in real world contexts.
- Assign molecules as chiral or achiral and identify stereocentres. Apply nomenclature descriptors to molecules and metal complexes including *R*, *S*, *E*, *Z,* lambda, delta, *mer*, *fac*, *cis*, *trans*.

Structure Determination

(Blackman Ch 20)

- Explain the fundamental principles behind analytical structural determination techniques including MS, IR, ^{1}H NMR. Given two chemical structures, decide which analytical technique would be best suited to distinguish them.
- Determine the structure of an unknown molecule using data from one or more spectroscopic techniques (MS, IR, ^{1}H NMR) and/or predict the spectra (IR, ^{1}H NMR) for a given chemical structure. Rationalise this determination by describing the H deficiency of the molecule, recognising symmetry in molecules to predict non-equivalent groups (e.g. multiple C=O groups by IR; different CH_3 groups by NMR), chemical shift of signals and the multiplicity of each signal in a ^{1}H NMR spectrum

Kinetics

(Blackman Ch 15)

- Define the rate for a given reaction in terms of the change of concentrations over time.
- Determine orders and rate constants from initial rate data.
- Calculate the half-life of a reactant in a first-order reaction.
- Identify the difference between a differential and an integrated rate equation.
- Manipulate differential and integrated second order rate equations.
- Apply the integrated first order rate equation.
- Apply the Arrhenius equation to relate rate to temperature, and to determine E_a and A from rate data at different temperatures.
- Display a conceptual understanding of the Arrhenius equation.
- Explain the concept of a reaction mechanism in terms of elementary reactions.
- Determine the molecularity of an elementary reaction and identify the rate-determining step in a mechanism.
- Define the role of a catalyst and explain how a catalyst can change the rate of a reaction.
- Identify techniques for experimental measurement of rates (e.g. UV-vis).

Organic Chemistry I – Nucleophiles, electrophiles, mechanisms and carbonyls

(Blackman Ch 16, 21)

- Apply the theory of nucleophiles and electrophiles to propose chemical mechanisms for nucleophilic addition reactions using curly arrow notation.

- Link the mechanism of an organic reaction to energy change through reaction coordinate diagrams.

Organic chemistry II – Alkyl halides, S_N1 and S_N2 reactions, nucleophilic substitution and additions

(Blackman Ch 16)

- Apply the theory of nucleophiles and electrophiles to recognise that there are two potential mechanisms for nucleophilic substitution reactions and predict which mechanism is most applicable given a set of reagents and or kinetic data. Make predictions on the stereochemistry of the products of these reactions.
- Link S_N^1 and S_N^2 mechanisms to energy change through reaction coordinate diagrams by identifying the rate determining step by considering activation energies and thus determining overall reaction order.
- Devise a multi-step synthesis of a target molecule, by applying a knowledge of nucleophilic addition reactions and nucleophilic substitution reactions.

Organic Chemistry III – Nucleophilic and electrophilic additions, electrophilic aromatic substitutions

(Blackman Ch 16)

- Apply the theory of nucleophiles and electrophiles to propose chemical mechanisms for electrophilic addition and electrophilic aromatic substitution reactions. Make predictions on the stereochemistry of the products of these reactions.
- Link electrophilic addition and substitution reactions to energy change through reaction coordinate diagrams.
- Devise a multi-step synthesis of a target molecule, by applying a knowledge of nucleophilic addition reactions, nucleophilic substitution reactions, electrophilic addition reactions and electrophilic aromatic substitution reactions.

Organic Chemistry IV – Multistep synthesis and Molecular machines

This is a capstone topic that brings together core theory covered in Chem1A and chem1B to explain and predict the structures of supramolecular and host-guest complexes that can be used in biological and artificial molecular machines.

3. Strategies and approaches to learning

3.1 Learning and teaching activities

The learning and teaching activities in this course consist of multiple teaching methods and modes of instruction which are delivered through a blended approach including Lectures, Tutorials, and Laboratories.

This course has been designed to engage you in learning by contextualising the material to students' prior experiences and knowledge. In addition, course content will be supplemented with interesting examples from research and industry. The laboratory component of this course will enable you to develop a proficiency in core chemistry laboratory skills while engaging in challenging and interesting laboratory practicals. In addition, this component of the course will contribute to the development of your higher-order analytical skills, while providing opportunity for cooperative learning with your peers.

3.1.1 Lectures and workshops (offered online only)

There are 4 hours of lectures and workshops each week. Depending on the lecturer and scheduling such as public holidays, classes will be delivered as either live sessions through Blackboard Collaborate or as video recordings and or digital lessons. Lecture notes will be posted on Moodle. You are strongly encouraged to join the live session to receive feedback through online polling and to ask questions pertaining to content. Lecture recordings will made available via the Lecture Recordings+ link on Moodle. However, there is no guarantee that the lecture recording software will capture the class correctly or even at all.

3.1.2 Tutorials (offered online or face to face)

Each week you'll join a small-group online tutorial in which you will delve more deeply into the focus topic. You are required to read through the tutorials in advance and identify questions that you would like the tutor to assist with answering. You are also encouraged to ask any further questions you might have regarding the focus topic.

3.1.3 Laboratory Classes (offered face-to-face on-campus only)

The laboratory classes provide an opportunity to learn the concepts and practice the calculations presented in lectures. Laboratory classes are also the place to learn practical skills and they are also the place where those skills are assessed.

You must **READ THE INTRODUCTION IN THE LABORATORY MANUAL** to be aware of all the requirements for passing the laboratory component of this course. Here are some of the main points regarding laboratory classes:

- **The following items of personal protective equipment (PPE) must be worn at all times in the laboratory:**
    - **safety eyewear**
    - **a facemask**
    - **a laboratory coat**
    - **fully enclosed footwear**

  You will not be permitted to work in thongs or open-top shoes or sandals or without a laboratory coat, facemask or safety eyewear.
- The schedule of experiments can be found on page 4 of the lab manual.
- All experiments require pre-lab work to be completed before your lab class.
- You must attend the laboratory class shown on your official timetable.
- You must arrive at the laboratory on time or you will be excluded from the class.
- *Repeat students must apply to the First Year Laboratory Coordinator if they want exemption from laboratory classes. Exemption is not automatic and is decided on a case-by-case basis.*

3.2 Expectations of students

It is your responsibility to ensure that you keep up to date with the course material, are aware of the assessments times and details and complete all required tasks by the advertised due date.

Occasionally we may be required to make changes to the course details presented in this document for reasons outside of our control (this is especially true during the COVID-19 pandemic). ALL changes will be announced via the important announcements on the Moodle page. You must check your UNSW student email (z1234567@unsw.edu.au) and the course Moodle site **AT LEAST EVERY TWO DAYS** to ensure you are up to date with understand your obligations for the course.

Ignorance of announcements or errors of interpretation of a due date or assessment requirement are not valid excuses for non-completion.

As a general rule, you should plan to do about one hour of independent study (e.g. completing assignments, readings and exam preparation) for every face-to-face hour of the course. In addition, you should manage your time so that you can complete your topics lessons and topics quizzes every week throughout the term rather than leaving them to the deadline – you will waste the multiple opportunities we provide to sit the validation tests if you are not prepared early!

3.2.1 Lectures

Students are expected to engage with all lectures each week. You should take notes and participate in problem-solving during lectures. The questions asked in lectures are a valuable source of feedback – they will help you to target the areas that will require further clarification in your personal study time.

3.2.2 Tutorials

Attendance at all tutorials is compulsory as no worked answers to tutorial problems are provided outside of these sessions. Tutorial classes are not graded directly but exam questions are linked to the tutorial material.

The purpose of tutorials is to provide activities for you that consolidate the concepts covered in lectures. You are expected to come prepared by having attempted the assigned pre work. You are expected to engage in tutorials by seeking help and completing work as directed.

3.2.3 Laboratories

SEE THE LABORATORY MANUAL FOR MORE DETAILS, including what to do if you are unavoidably absent from a lab class, how to complete assessments, and the criteria for grading your laboratory work.

3.3 Academic Misconduct

Students and staff are, of course, governed by the normal laws which regulate our everyday lives. But, in addition, the University has its own code of rules and conduct, and can impose heavy penalties on students who breach them. Penalties range from failure in a subject, loss of privileges, fines, payment of compensation, and suspension, to exclusion from study for a certain period or even permanent expulsion from the University.

It is important to realise, however, that misconduct within the University covers a much wider field than simply behaviour which is offensive or unruly, or which may cause damage to other people or property. Misconduct which may lead to a student being disciplined within the University includes anything regarded as academic misconduct according to current academic usage, as well as any conduct which impairs the reasonable freedom of other persons to pursue their studies or research or to participate in University life.

It is most important that students realise just how broad the definition of Academic misconduct may be. It certainly covers practices such as cheating or copying or using another person's work. Sometimes, however, practices which may have been acceptable at school are considered to be misconduct according to current Academic usage within a University. For example, academic misconduct can occur where you fail to acknowledge adequately the use you have made of ideas or material from other sources (see the UNSW Student Guide for examples).

The following are some of the actions which have resulted in students being found guilty of academic misconduct in recent years:

- impersonation in examinations;
- Posting screenshots of digital assessments online
- Seeking answers to assessment questions online through crowd sourcing websites and forums
- failing to acknowledge the source of material in an assessment
- taking of unauthorised materials into an examination;
- submitting work for assessment knowing it to be the work of another person;
- improperly obtaining prior knowledge of an examination paper and using that knowledge in the examination.
- Providing another students with the means to cheat or collude on an assessment tasks

Students found guilty of academic misconduct are usually excluded from the University for two years. Because of the circumstances in individual cases, the period of exclusion can range from one term to permanent exclusion from the University.

4. Assessments

4.1 Assessment Overview

The assessment components of the course and the proportion of your final course mark allocated to each is as follows:

Component	Subcomponents	Total
Laboratory assessment	10% (core skills) 10% (non-core skills)	20%
Revision quizzes	9 weekly quizzes	10%
Mid-term tests	15% Mid-term test 1 15% Mid-term test 2	30%
Final Examination	–	40%

A pass in CHEM1021 requires:

- **you achieve a course mark of at least 50, and**
- **you are awarded all core laboratory skills (see laboratory manual for more details), and**
- **you achieve a mark of at least 35.0%, weight-averaged across the mid-term tests and the final exam (i.e. 24.5 marks from the 70 course marks from examinations/tests).**
- **Students must attend a minimum of 6 out of 8 laboratory classes**

You will receive a course mark of between 0 and 100. A grade (HD, DN, CR, PS, UF or FL) will be awarded depending on your course mark and completion (or lack of completion) of the other criteria described above. Further information about the UNSW grading system can be found here: https://student.unsw.edu.au/grades

4.2 Weekly Revision Quizzes

There are online Revision Quizzes most weeks during the term. The topics and opening and closing dates can be found on Moodle.

- To attempt a quiz, logon to Moodle (https://moodle.telt.unsw.edu.au/), navigate to your course and scroll down to the 'Revision Quizzes' section. Select the relevant quiz you wish to attempt. In most cases, only one quiz will be available at any given time.
- In most cases, quizzes are open for *one* week only. They generally open at 12:01am on Monday morning, and close at 11:59pm on Sunday night. These details are displayed in the quiz itself, before you make an attempt. During this time, you can make up to **3 attempts** to answer the quiz questions (using any help you desire, taking as long as you want up until the quiz close time). You will most likely get a different version of the question on each attempt.
- You must get full marks on 1 of your 3 possible attempts at each quiz to get 1 added to your total quiz score. If you do not get full marks in any of your attempts, you will be awarded a score of zero for that quiz. At the end of the term, **your best 7 quiz marks will be added together then scaled to give a mark out of 10**, which will account for 10% of your final overall mark for this course.
- After the period for answering a quiz has closed, you will no longer be able to attempt the quiz. However, you will be given feedback and hints on how to answer the questions in the quiz immediately after each attempt.

4.3 Mid-Term Tests

There will be two mid-term tests each of 45 minutes' duration.

- **Test 1** is currently planned for Week 5 during your regular scheduled lecture timeslot on **Monday, 28 June 2021**.
- **Test 2** is currently planned for Week 10 during your regular scheduled lecture timeslot on **Monday, 2 August 2021**

If you cannot attend the lecture timeslot due to a permitted timetable clash, please contact trinah@unsw.edu.au as soon as possible. **Permitted clashes do not automatically excuse absences from the test**.

The official details will be posted on Moodle approximately 1–2 weeks before the date of the examination. it is YOUR RESPONSIBILITY to ensure that you have read and understood their details BEFORE sitting each test.

4.4 Laboratory Assessment

Laboratories are assessed based on work completed and/or submitted during your weekly lab classes.

Half of the laboratory mark will be awarded for completing core laboratory skills. In most cases you will have multiple opportunities to obtain each core skill across the term. Once all core skills are completed your will be awarded with 10% of the course marks.

The remaining half of the laboratory mark will be determined from non-core skills assessment.

Further details are available in the laboratory manual on Moodle. Please ensure you read through these carefully.

4.5 Final Examination

The final examination will cover the entire contents of the course including content from lectures, tutorials and the laboratory component. As a guide, the amount of material on a syllabus topic in the exam will be in proportion to the number of lectures given for that topic. The final exam will be conducted online via Moodle. **You will be advised of the date of your final exam through an email from the central exam scheduling system – the date is set centrally, not by the School of Chemistry.** Once the date is confirmed explicit details, including start time, will be given on Moodle.

If you have applied for special consideration, you should arrange to make yourself available for possible further assessment. Notification of details of the further assessment will be sent via your student email address (z1234567@student.unsw.edu.au).

4.7 Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has be assessed, you will be contacted via your student email address to advise the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control which affect your ability to study, you do not sit an examination or submit an assessment which does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

If you fall ill DURING an assessment and your performance is affected contact s.maisey@unsw.edu.au immediately for advice – it is too late to advise us after the assessment has finished if you have already begun sitting it.

If you are excluded from attending a face-to-face class because you have been instructed to self-isolate due to COVID-19 (including if you live in an area that has been locked down) you are advised to apply for special consideration if it means that you will miss one or more laboratory class as a precaution, However, please carefully read the attendance requirement for the laboratory component in the lab manual as special consideration does not exempt you from this requirement.

4.8 Supplementary Assessment

A supplementary examination may be offered in cases where you have applied for and received special consideration. The supplementary exam period for this term is **Monday 6 September – Friday 10 September inclusive** The time, date and venue of your test will be confirmed via student email approximately 1 week before the exam date. All students granted a supplementary exam are expected to make themselves available to attend. No alternative dates or times will be guaranteed. A supplementary examination may consist of a written paper and in some cases an oral examination. Averages will not be given in place of a final exam mark or supplementary exam mark.

5. Academic integrity, referencing and plagiarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.

Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits**:** honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and **plagiarism** can be located at:

- The *Current Students* site https://student.unsw.edu.au/plagiarism, and
- The *ELISE* training site http://subjectguides.library.unsw.edu.au/elise/presentation

The *Student Conduct and Integrity Unit* provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct.

6. Readings and resources

6.1 Textbooks and Notes:

- Blackman, Bottle, Schmid, Mocerino and Wille, "Chemistry," 4th Ed., Wiley. This book is available in print format through the UNSW Bookshop: https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9780730363286&16202288 or in various formats from Wiley Direct Online: http://www.wileydirect.com.au/buy/chemistry-4th-edition/
- Aylward and Findlay, "SI Chemical Data," 6th Ed. or later.
- Term 2, 2021 Laboratory Manual (available for purchase in print at the UNSW Bookshop; also downloadable from Moodle).
- Term 2, 2021 Tutorial Notes (available on Moodle).

6.2 Need Help?

There are several people who can help you with problems. The appropriate person may differ depending on the problem.

- First, check the “Important Announcements” and the “Q&A” forums on Moodle – your question may have been asked by another student and answered before.
- For problems relating to lectures – post your question on Moodle, or contact your lecturer.
- For tutorial problems − post your question on Moodle, or ask your tutor during tutorial classes.
- For laboratory problems − post your question on Moodle, or alternatively ask your lab tutor during your lab classes.
- If you are experiencing personal difficulties that may be affecting your academic performance, please contact UNSW Student Support for advice and assistance: https://student.unsw.edu.au/advisors
- For all other enquires (including Moodle issues) − contact Trinah, the Teaching Support Officer (trinah@unsw.edu.au).

7. Administrative matters

If you have any administrative questions, try the following sources of information (in order):

- This course outline
- The Moodle site for this course (including the Important Announcements and FAQ sections)
- Chemistry Student Services:
    - Trinah De Leon; trinah@unsw.edu.au; +61 (2) 9385 4651
- Science Student Services:
    - +61 (2) 8936 7005; https://nucleus.unsw.edu.au/en/contact-us

8. Additional support for students

Other avenues of support include:

- The Current Students Gateway: https://student.unsw.edu.au
- Academic Skills and Support: https://student.unsw.edu.au/skills
- Student Wellbeing, Health and Safety: https://student.unsw.edu.au/wellbeing
- Equitable Learning Services: https://student.unsw.edu.au/els
- UNSW IT Service Centre: https://www.myit.unsw.edu.au