
CHEM241: Physical and Inorganic Chemistry

Subject Outline

6 credit points

Subject Information

Autumn, 2026, Wollongong
On Campus

On-Campus Delivery This subject is delivered in-person and includes on-campus or other location-based learning activities that cannot be undertaken by students studying Online/Distance. Students unable to attend campus or any other nominated physical delivery location should not enrol in this subject

Subjects with a delivery mode of On Campus and/or Flexible with International Student enrolments will be delivered in accordance with the ESOS National Code. That is, online learning experiences (such as lectures, tuition, and resources) will be supplementary to in-person learning experiences such as scheduled classes and/or scheduled contact hours.

UOW may need to modify teaching locations, teaching delivery, and assessment delivery at short notice in response to unforeseen circumstances such as health or environmental factors.

For up-to-date information please refer to your subject's Moodle site.

The Faculty of Science, Medicine and Health

The Faculty of Science, Medicine and Health offers a range of undergraduate and postgraduate programs designed to meet the needs of a diverse student population. We carry out world-leading research which is strongly aligned with our teaching program

As a student of our faculty, you will be actively engaged in learning with extensive clinical, laboratory and/or field work experiences, use of advanced educational technologies and opportunities for enriching work experience. More information about the Faculty of Science, Medicine and Health and our School is available on our web page: <https://www.uow.edu.au/science-medicine-health/>

Within many of our courses, attending a workplace experience or clinical placement is an exciting part of your course program. Whilst integral to your learning, these health-related placements also let you experience what it's like to work as a professional in real-life workplace settings. More information about requirements for Health Placements is available on our webpage: <https://www.uow.edu.au/student/health-placements/>

Teaching Staff

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Expectations of Students

UOW values are intellectual openness, excellence and dedication, empowerment and academic freedom, mutual respect and diversity, recognition and performance. We will provide a safe, equitable and orderly environment for the University community, and expect each member of our community to behave responsibly and ethically ([Student Conduct Rules](#)).

We expect that students demonstrate these values and professional behaviour, both face to face and online, making genuine efforts to complete their studies successfully, arriving on time to class, taking part constructively in class discussions and activities, demonstrating appropriate professional and ethical conduct in all communication with UOW staff and community members, and submitting assignments on time (or completing a request for Academic Consideration in advance if needed).

Guiding Communication Principles for Students

Moodle Announcements will be the primary platform for communication of general information to students

- Students should ensure they regularly check the main announcements forum at the top of each subject's Moodle site.
- It is the student's responsibility to check all subject Moodle sites regularly for information and notifications.

SOLS messages will be used for all central communication relating to the following:

- Administrative matters relating to student enrolment
- Critical information relating to course or subject, e.g. Changes to assignments, policy updates, class cancellations or changes
- Timetable information
- Security and emergency information
- Students are encouraged to check SOLS messages daily as these messages are often of high priority

SOLS and Moodle announcements can NOT be responded to.

Appropriate Online Behaviour

The University is committed to providing a safe, respectful, equitable and orderly environment for the University community, and expects each member of that community to behave responsibly and ethically. Students must comply with the University's [Student Conduct Rules](#) and related policies including the [IT Acceptable Use Policy](#) and [Bullying Prevention Policy](#), whether undertaking their studies face-to-face, online.

For more information on appropriate communication and etiquette in the online environment please refer to the guide [Online and Email Etiquette](#).

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Hardcopies of this document are considered uncontrolled please refer to your Moodle site for the latest version.

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Section A: General Information

Learning Outcomes

Subject Learning Outcomes

On successful completion of this subject, students will be able to:

1. Distinguish between and explain the laws of thermodynamics and thermodynamic functions (ΔH , ΔG , ΔS and K) and their application to chemical systems
2. Discuss introductory quantum mechanical principles including particle-in-a-box, atomic orbitals and chemical bonding
3. Explain fundamental chemical concepts in coordination chemistry, organometallic chemistry, and bioinorganic chemistry
4. Develop laboratory skills to plan and perform experiments safely
5. Interpret experimental results and formulate conclusions in written and/or oral formats
6. Employ basic mathematics to solve quantitative chemical problems

Subject Description

This subject teaches the essential components of coordination chemistry of physical chemistry with applications in metal-based catalysis, energy generation and storage, high-performance materials; areas that align with the United Nations Sustainable Development Goals (*e.g.* energy conversion, clean water, resource sustainability, climate). Students will learn the fundamental concepts of thermochemistry, thermodynamics and apply these concepts to analyse chemical reactions. Concepts in quantum mechanics will also be taught including wave-particle duality, atomic spectra and the photoelectron effect; these fundamental concepts will be applied to the understanding of molecular orbitals and chemical bonding. Students will also learn the theories central to modern coordination chemistry: transition metal electronic structure, bioinorganic and organometallic chemistry. Students will gain hands-on laboratory experience and skills in the safe handling of potentially hazardous chemicals, the application of a range of techniques of chemical synthesis and purification to the preparation of coordination compounds as well as collecting spectroscopic and numerical data from a range of sources: thermochemical and kinetic data in physical laboratories as well as Infrared (IR), UV/Visible and Nuclear Magnetic Resonance (NMR) spectra in synthetic laboratories. Skills in communicating results will focus on conversion of experimental data from instrument-output into concise, human-readable reports. Students will also have opportunities to practise both teamwork as well as individual work as part of this subject.

Course Handbook

Information about subject pre-requisites, co-requisites and restrictions as well as course completion requirements and Course Learning Outcomes can be found in the [Course Handbook](#).

Subject Details: Practical Activities, eLearning, Readings and Materials

Subject eLearning

The University uses the eLearning system Moodle to support all coursework subjects. The subject Moodle site can be accessed via your SOLS page.

Safety Guidelines

The rules below are general rules that are required when participating in labs, practicals, fieldwork or simulated fieldwork activities. Before commencing these activities you are to ensure that you understand specific procedures and policy related to safety.

- All first year students undertaking Chemistry (CHEM101/102/104/105) must complete the Moodle WHS Induction (see the subject Moodle site for more details below)

- Before commencing lab/practical/fieldwork activity you are to ensure that you understand specific procedures and policy related to safety.
- You may need to review a Risk Assessment and complete a Participant Acknowledgement form before commencing any fieldwork/practical work. These materials will be made available by the supervisor/Subject Coordinator.
- You must inform the Subject Coordinator of any medical conditions which may impact upon your ability to participate in these activities before commencing the practical.
- All Reasonable Adjustment cases (Access Plans) must be discussed with the Subject Coordinator prior to commencing the activity.
- Participation in the lab/practical/field/simulation activities may be denied to students who do not abide by these, and other conditions which may be specified by the Subject Coordinator.
- Never use any equipment or attempt any experiment without checking the safety implications with your laboratory supervisor or experienced delegated laboratory worker
- Undergraduate students are not permitted to work after hours unless there is appropriate approval and supervision.
- For subjects including field trips, students may be required to contribute to costs associated with the provision of field trips that form part of the course of study.

FOUNDATIONAL Work Integrated Learning

This subject contains elements of 'Foundational WIL'. Students in this subject will observe, explore or reflect on possible career pathways or a work-related aspect of their discipline.

Additional Subject Details

<https://www.uow.edu.au/united-nations-sustainable-development-goals/sdg-subjects-and-courses/>

This subject aligns with the United Nations Sustainable Development Goals (SDGs) and is part of UOW's SDG Portfolio which aims to ensure that our students are well informed global citizens that can continue to contribute to realising sustainable development through their studies and careers by being proactive, responsible and educated in relation to how realising the Global Goals will better the world.

The full **lecture, tutorial and laboratory program** for this subject can be found on the subject Moodle site.

Using Generative Artificial Intelligence (GenAI)

UOW is committed to embracing gen AI as a tool to enhance learning and development of important digital and work-readiness skills.

Your subject coordinator will provide specific guidance on the use of gen AI in your assessment tasks via your Subject Outline and/or your subject Moodle site. If gen AI use is permitted, it should be used thoughtfully, critically, and in ways that support your own learning.

Guidance on appropriate use of AI in assessments, including how to [acknowledge GenAI](#) can be found on the [Using Generative Artificial Intelligence in Assessment website](#)

You are responsible for all work you submit, and ethical use of gen AI is an important part of maintaining academic integrity. Misuse or unauthorised use may breach the [Academic Integrity Policy](#).

Major Text(s)

There are no required textbooks for this subject. The following are recommended references for the physical chemistry component of this subject and are available in the library:

"*Atkins' Physical Chemistry*" by P. Atkins, J. de Paula (and J. Keeler). Several editions are available in the library: [11th](#), [10th](#), [9th](#), [7th](#).

"*Elements of Physical Chemistry*" by P. Atkins, J. de Paula. Several editions are available in the library: [6th](#), [3rd](#).

The recommended textbook for the inorganic section of the subject is:

"*Inorganic Chemistry: Pearson New International Edition*", 5th edition, by G. Miessler, P. Fischer & D. Tarr. This is available online from the library [here](#).

If there is a textbook available for purchase, you can find the details at University Bookshop <https://unishop.uow.edu.au/>

Recommended Readings and Other Resources

The following references complement the prescribed textbooks:

- “*The Organometallic Chemistry of the Transition Metals*”, 6th edition, by R H. Crabtree. This is available online from the library [here](#).
- “*Organometallics: a concise introduction*”, by C. Elschenbroich. This is available in the [library](#)

This is not an exhaustive list of references. Students should also use the library catalogue and databases to locate additional resources.

Additional Materials

Students *must* purchase a lab coat and safety glasses in order to participate in the laboratory component of this subject - these are available from the UOW bookshop.

Lectures, Tutorials and Attendance Requirements

Lecture Times *

UOW may need to modify teaching locations, teaching delivery, and assessment delivery at short notice in response to unforeseen circumstances such as health or environmental factors.

For up-to-date information please refer to your subject’s Moodle site.

Up to date timetable and delivery information is located at <http://www.uow.edu.au/student/timetables/index.html>

You can access your personal timetable by logging into SOLS and selecting 'My Timetable'

Lecture Program *

| Week | Commencing | Topics Covered |
|------|-------------|---|
| 1 | 02 Mar 2026 | Thermodynamics |
| 2 | 09 Mar 2026 | Thermodynamics |
| 3 | 16 Mar 2026 | Quantum Mechanics |
| 4 | 23 Mar 2026 | Quantum Mechanics |
| 5 | 30 Mar 2026 | Coordination Chemistry |
| 6 | 06 Apr 2026 | Coordination Chemistry |
| 7 | 13 Apr 2026 | Coordination Chemistry and Mid-session Quiz |
| | 20 Apr 2026 | Mid-Session Recess |
| 8 | 27 Apr 2026 | Coordination Chemistry |
| 9 | 04 May 2026 | Coordination Chemistry |
| 10 | 11 May 2026 | Organometallics and Catalysis |
| 11 | 18 May 2026 | Organometallics and Catalysis |
| 12 | 25 May 2026 | Organometallics and Catalysis |
| 13 | 01 Jun 2026 | Revision Lectures |

| | | |
|--|-------------|---------------------|
| | 08 Jun 2026 | Study Recess |
| | 13 Jun 2026 | Examinations |
| | 20 Jun 2026 | Examinations |

* The above times and program may be subject to change. Students will be notified of any change via SOLS.

Additional Lecture Comments

Essential Physical Chemistry

- General introduction to enthalpy, entropy, Gibbs function
- Bond energy, proton affinity (PA), electron affinity (EA), ionization potential (IP)
- Quantisation; wave/particle duality, particle in a 1D Box
- Linear Combination of Atomic Orbitals (LCAO)

Introduction to coordination chemistry

- Trends amongst the *d*-block elements
- Bonding
- Coordination geometries and numbers
- Reactions of coordination complexes; Ligand substitution
- Formation constants
- Hard/Soft Acid/Base theory
- Nomenclature
- Isomers and chirality

Crystal Field Theory

- Theory and background to Crystal Field Theory
- Electronic transitions
- Relationship to spectroscopic properties
- Relationship to magnetism in coordination complexes

Magnetism in solids

- Types of magnetism
- Ferromagnets
- Antiferromagnets

Organometallic Chemistry and Catalysis

- Introducing and using the 18-electron rule
- Understanding σ - and π - bonds in the transition metals and main group metals
- Introduction to organometallic reaction mechanisms
- Homogenous catalysis by organometallic complexes

Recording of Teaching and Learning Activities

The University of Wollongong supports the recording of UOW educational content as a supplemental study tool, to provide students with equity of access, and as a technology-enriched learning strategy to enhance the student experience.

If you make your own recording of a lecture, class, seminar, workshop or any other educational session provided as part of your course of study you can only do so with the explicit permission of the lecturer and those people who are also being recorded.

You may only use educational content recorded through the delivery of subject or course content, whether they are your own or recorded by the university, for your own educational purposes. Recordings cannot be altered, shared or published on another platform, without permission of the University, and to do so may contravene the University's Copyright Policy, Privacy Policy, Intellectual Property Policy, IT Acceptable Use Policy and

Student Conduct Rules. Unauthorised sharing of recordings may also involve a breach of law under the Copyright Act 1969.

Most lectures in this subject will be recorded, when they are scheduled in venues that are equipped with lecture recording technology and made available via the subject Moodle site within 48 hours.

Your Privacy - Recording of Teaching and Learning

In accordance with the Student Privacy & Disclosure Statement, and Lecture Recording Procedures when undertaking our normal teaching and learning activities, the University may collect your personal information. This collection may occur incidentally during the recording of lectures in equipped venues (i.e. when your identity can be ascertained by your image, voice or opinion), or via the delivery of online content therefore the University further advises students that:

- Lecture recordings are made available to students, university staff, and affiliates, securely via the Learning Platform;
- Recordings are made available only for the purpose for which they were recorded, for example, as a supplemental study tool or to support equity and access to educational resources;

If you have any concerns about the use or accuracy of your personal information collected in a lecture recording, you may approach your Subject Coordinator to discuss your particular circumstances.

The University is committed to ensuring your privacy is protected. If you have a concern about how your personal information is being used or managed, please refer to the University's Privacy Policy or consult our Privacy webpage <https://www.uow.edu.au/privacy/>

Tutorial/Seminar/Workshop Times

The Faculty uses the SMP Online Tutorial System and your class times and locations can be found at <https://www.uow.edu.au/student/timetables/index.html>. Please note that class times on the timetable are provisional and may change.

Tutorial/Seminar/Workshop Program

Where the restrictions require temporary adjustments for delivery and tutorial/seminar/workshop arrangements, any necessary changes will be advised and provided by your Subject Coordinator. Please check Subject Moodle site regularly

| Week | Week Commencing | Topics Covered |
|------|-----------------|--|
| 1 | 02 Mar 2026 | NO LAB Thermodynamics Tutorial |
| 2 | 09 Mar 2026 | Physical Chemistry Lab 1 Thermodynamics Tutorial |
| 3 | 16 Mar 2026 | Physical Chemistry Lab 2 Quantum Mechanics Tutorial |
| 4 | 23 Mar 2026 | NO LAB Quantum Mechanics Tutorial |
| 5 | 30 Mar 2026 | Physical Chemistry Computer Lab Coordination Chemistry Tutorial |
| 6 | 06 Apr 2026 | NO LAB Coordination Chemistry Tutorial |
| 7 | 13 Apr 2026 | Inorganic Chemistry Lab 1 NO TUTORIAL (Mid-session Quiz) |

| | | |
|----|-------------|---|
| | 20 Apr 2026 | Mid-Session Recess |
| 8 | 27 Apr 2026 | Inorganic Chemistry Lab 2 Coordination Chemistry Tutorial |
| 9 | 04 May 2026 | Inorganic Chemistry Lab 3 Coordination Chemistry Tutorial |
| 10 | 11 May 2026 | Inorganic Chemistry Lab 4 Organometallics and Catalysis Tutorial |
| 11 | 18 May 2026 | Inorganic Chemistry Lab 5 Organometallics and Catalysis Tutorial |
| 12 | 25 May 2026 | Inorganic Chemistry Lab 6 Organometallics and Catalysis Tutorial |
| 13 | 01 Jun 2026 | Laboratory Practical Skills Test Revision Tutorial |
| | 08 Jun 2026 | Study Recess |
| | 13 Jun 2026 | Examinations |
| | 20 Jun 2026 | Examinations |

The above program may be subject to change.

Recent Improvements to Subject

The Faculty of Science, Medicine and Health is committed to continual improvement in teaching and learning and takes into consideration student feedback from many sources including, direct student feedback to tutors and lecturers and responses to the Subject and Course Evaluation Surveys. Feedback is also used to inform comprehensive reviews of subjects and courses.

This subject ran for the first time in 2024 and is the combination of two previously separate subjects. Incremental changes to the subject based upon student feedback and reflections from teaching staff on student learning outcomes after assessment are continuously made. Some changes include improved clarity in the assessment and participation requirements in the subject outline, as well as changes to the laboratory programme to include a much larger variety of modern analysis and synthesis techniques such as data-processing and presentation, microscale synthesis techniques, student-led risk assessment and practical assessment. There is an increased focus on scaffolding of key practical skills in the early lab experiments and then a phased transition to student independence in skills performance. These changes to the subject reflect the need to maintain parity with best practice in modern laboratory practical design and coincides with the Chemistry Course Review that highlights the increased importance of skills-based education in STEM subjects. It is anticipated that the skills assessment will increasingly become the focus of the subject as it evolves in future years.

Extraordinary Changes to the Subject Outline

In extraordinary circumstances the provisions stipulated in this Subject Outline may require amendment after the Subject Outline has been distributed. All students enrolled in the subject must be notified and have the opportunity to provide feedback in relation to the amendment, where practicable, prior to the amendment being finalised.

Learning Analytics

Learning Analytics data (such as student engagement with Moodle, access to recorded lectures, University Library usage, task marks, and use of SOLS) may be used by the Subject Coordinator and your faculty's Head of Students to assist in analysing student engagement, and to identify and recommend support for students identified who may be in need of assistance. If you have questions about the kinds of data the University uses, how we collect it, and how we protect your privacy in the use of this data, please refer to <https://www.uow.edu.au/privacy/>

Section B: Assessment

Assessment Summary

| Assessment Item | Form of Assessment | % |
|-----------------|---------------------|------|
| Assessment 1 | Quiz | 15% |
| Assessment 2 | Lab/Prac/Simulation | 40% |
| Assessment 3 | Participation | 10% |
| Assessment 4 | Exam | 35% |
| | TOTAL MARKS | 100% |

Please note: Copies of student work may be retained by the University in order to facilitate quality assurance of assessment processes.

Assessment 1: Quiz - Mid-session Quiz

| | |
|------------------------------|--|
| Marking Criteria | Marks will be awarded based on the answers to the questions assigned. |
| Length | 75 minutes |
| Weighting | 15% |
| Assessment Due | 13 Apr 2026 (In your assigned tutorial in Session Week 7) |
| Type of Collaboration | Individual assessment |
| Style and format | Paper-based in-class quiz. Submitted at the end of the class. |
| Generative AI use | The use of Generative AI is not permitted in this assessment task as an invigilated on-paper quiz. |
| Assessment submission | Submit a hardcopy to your tutor in class. |
| Assessment return | Two weeks after due date. |
| Detailed information | In person, invigilated quiz that will be held during the Week 7 tutorial class. This quiz will feature a mixture of written answers (calculations or short written responses) and multiple-choice questions. This quiz covers the lecture and tutorial content from Weeks 1-6. |

Assessment 2: Lab/Prac/Simulation - Laboratory Assessments

| | |
|------------------------------|---|
| Marking Criteria | Marks will be allocated based on data collection and analysis (incl. accuracy and precision), performance in the laboratory, answers to questions, lab reports, and the submission of samples, where appropriate. |
| Length | A mixture of Moodle quizzes, templated reports, self-prepared reports. |
| Weighting | 40% |
| Assessment Due | 17 Mar 2026 (Tuesday in Session Week 3) 24 Mar 2026 (Tuesday in Session Week 4) 30 Mar 2026 (In workshop in Session Week 5) 04 May 2026 (In workshop in Session Week 9) 18 May 2026 (In workshop in Session Week 11) 01 Jun 2026 (In workshop in Session Week 13) |
| Type of Collaboration | Individual assessment |
| Style and format | Physical chemistry experiments (Experiments 1-2 and Computer Lab) are templated and submitted through Moodle/Turnitin (15%). Inorganic chemistry experiments are assessed by a templated reports. Experiment 3 is assessed through a formative (not grade affecting) templated report to provide feedback to students before later summative (grade affecting) reports. |

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| | Experiments 4 and 5 are assessed by summative (grade affecting) templated reports submitted through Moodle (5 and 10% respectively). The practical skills demonstrated in the laboratory will be assessed in a practical skills test (10%) held in week 13. Further guidance is found in the laboratory manual available from the CHEM241 Moodle site. |
| Generative AI use | While generative AI is permitted in the preparation of laboratory assessments, it is unlikely to be comprehensive in its utility. Consider carefully if you need to use it and for what purpose. Recommended uses of generative AI for this task include asking questions about material you do not understand, proofreading your work or generating plots of laboratory data collected. |
| Assessment submission | Online via Moodle or in-lab |
| Assessment return | Two weeks after due date |
| Detailed information | This is a hurdle assessment: to pass the subject students must receive a pass grade or higher in this assessment. All submitted work for the practical subject must be word processed and submitted in PDF format. All data must be plotted by the student from data collected in the laboratory. Photographs of data are not acceptable. Handwritten reports will not be accepted. |

Assessment 3: Participation - Tutorial Participation

| | |
|------------------------------|---|
| Marking Criteria | Marks will be allocated based upon attendance at tutorials |
| Length | |
| Weighting | 10% |
| Assessment Due | To Be Announced |
| Type of Collaboration | Individual assessment |
| Style and format | Attendance and engagement with tutorials is essential for passing the subject. Participation will be assessed by the staff taking tutorials. Attendance will be recorded. To meet the assessment criteria for this task students are encouraged to i) ask and answer questions in tutorials, ii) engage with and attempt tutorial questions. In order to receive the maximum marks for this assessment students must attend at least 10 out of the 11 of the timetabled tutorials and attempt to meet the engagement benchmarks described above. Students may miss one of the eleven timetabled tutorials and still achieve full marks for this task. |
| Generative AI use | While generative AI is permitted in tutorials, it is unlikely to be comprehensive in its utility. Consider carefully if you need to use it and for what purpose. Recommended uses of generative AI for this task include asking questions about material you do not understand, checking your work or plotting data for the purposes of calculations. |

Assessment 4: Exam - Final Exam

| | |
|------------------------------|--|
| Marking Criteria | Marks will be awarded based on the answers to the questions assigned. |
| Length | 3 hours |
| Weighting | 35% |
| Assessment Due | The final exam will be held during the UOW exam period, and students should ensure they are available during this period. Students will receive a SOLSmail advising when full details of the delivery format, and date of the final exam are available in the SOLS Exam Timetable. |
| Type of Collaboration | Individual assessment |
| Style and format | Written answers and calculations to questions. |

| | |
|-----------------------------|---|
| Generative AI use | Generative AI is not permitted for use during the on-campus final exam. |
| Detailed information | This final exam will be an invigilated, on campus exam held during the exam period. |

Minimum Requirements to Pass this Subject

To receive a clear pass (P) in this subject a total mark of 50% or more and meeting all the subject learning outcomes (SLOs) must be achieved. In addition, failure to meet any of the minimum performance requirements is grounds for awarding a Technical Fail (TF) in the subject, even where total marks accumulated are greater than 50%.

The minimum performance requirements for this subject are:

- Overall mark $\geq 50\%$ **AND**
- Obtain a pass mark or better (50% or more of the available marks) over all practical assignments (assessment task 2) **AND**
- meet the minimum attendance and participation requirements

Minimum Student Attendance and Participation

Practical Laboratories: Attendance in laboratories is compulsory and students must attend 100% of classes. Students must also complete mandatory pre-lab safety quizzes *before* any practical activity. Absences will require the submission of an application for Academic Consideration via SOLS and the presentation of suitable documentation, for example a Medical Certificate, to Student Central *before*, or *on* the assessment/s due date. Where evidence is required, students must provide evidence no later than three working days after the assessable item's due date for their request to be considered. Students cannot apply for academic consideration for an exam or assessment task after completing and submitting that exam or assessment task. For further details about applying for academic consideration visit the Student Central webpage:

<http://www.uow.edu.au/student/central/academicconsideration/index.html>

Students with Academic Consideration must still attend a *minimum* of 75% of practical classes across the inorganic and physical laboratories to meet this requirement.

Introduction to the Subject Session: Attendance is compulsory for this session held in the first lecture in week 1. Students who miss this session will be provided with an opportunity to attend a supplementary session to meet this subject participation requirement.

Tutorials: Tutorial attendance is compulsory and assessable: up to 10% is available to students if they attend and participate in the tutorials. Attendance is recorded. Students may miss one of the eleven timetabled tutorials and still achieve full marks for this task.

Hurdle Assessment

Subjects may include a hurdle assessment. A hurdle assessment is an assessment that requires a minimum level of performance as a condition for passing the subject. Examples include, achievement of a pass grade or above in a skills-based assessment or final examination. Hurdle assessments are applied to subjects to ensure students:

1. meet learning outcomes
2. demonstrate you can complete a task safely and/or meet professional standards.

For more on hurdle assessments see the Assessment and Feedback Policy [Section 8: Hurdle Assessments \(50-51-52\)](#).

Failure to meet a hurdle assessment requirement may constitute grounds for the award of a Technical Fail (TF) grade in this subject.

Should this subject contain a hurdle assessment, it will be stated under the specific assessment in Section B: Assessments.

UOW Grade Descriptors

The UOW Grade Descriptors are general statements that communicate what our grades represent, in terms of standards of performance, and provide a frame of reference to ensure that assessment practice across the University is appropriate, consistent and fair. Grade Descriptors are expressed in general terms so that they are applicable to a broad range of disciplines. Grade Descriptors are available here <https://www.uow.edu.au/student/exams/results/>. For more information on the UOW grade descriptors refer to the Teaching and Assessment: Assessment and Feedback Policy: [Teaching and Assessment: Assessment and Feedback Policy](#)

Assessment Learning Outcome Matrix

| Learning Outcomes | Measures - Assessment weighting | | | |
|---|---------------------------------|---------------------------------|---------------------------------|---------------------|
| | Mid-session Quiz (15%) | Laboratory Assessments (40%) | Tutorial Participation (10%) | Final Exam (35%) |
| Distinguish between and explain the laws of thermodynamics and thermodynamic functions (ΔH , ΔG , ΔS and K) and their application to chemical systems | ✓ | ✓ | ✓ | ✓ |
| Discuss introductory quantum mechanical principles including particle-in-a-box, atomic orbitals and chemical bonding | ✓ | ✓ | ✓ | ✓ |
| Explain fundamental chemical concepts in coordination chemistry, organometallic chemistry, and bioinorganic chemistry | ✓ | ✓ | ✓ | ✓ |
| Develop laboratory skills to plan and perform experiments safely | | ✓ | | |
| Interpret experimental results and formulate conclusions in written and/or oral formats | | ✓ | | |
| Employ basic mathematics to solve quantitative chemical problems | | ✓ | ✓ | ✓ |

Submission, Retention and Collection of Written Assessment

Assessed work must be handed in by the date and time listed under each assessment task. All assessment tasks must represent the enrolled student's own ORIGINAL work and must not have been previously submitted for assessment in any formal course of study.

Extensions

Students requesting an extension of time to submit an assessment task, deferred exam or exemption of a compulsory attendance requirement, must apply using Academic Consideration through SOLS. Students must apply before, or on the assessment/s due date and where evidence is required, students must provide evidence no later than three working days after the assessable item's due date for their request to be considered. **For information on the Academic Consideration Policy, eligibility requirements and how to apply, see:** <https://www.uow.edu.au/student/admin/academic-consideration/>

Late Submission of Assessment Tasks and Penalties

Assessed work must be submitted in by the date and time given. If an assessment is submitted late, it will be marked in the normal way, and a penalty will then be applied.

In the absence of an approved request for Academic Consideration in the form of an extension, assessment tasks must be submitted in line with the assessment instructions.

- An assessment task that is submitted late will receive a penalty of 5% of the total possible marks for each 24-hour period, or part thereof, that it is late.
- Work submitted after seven calendar days will not be marked and will be given a mark of 0.
- No assessment task can be handed in for a mark once the assessment task has been returned to students.
- Penalties accrue on each day that the assessment task is late, including Saturday, Sunday and public holidays

Note: Assessments must still be submitted to meet minimum performance requirements even though no mark is to be awarded.

Collection

Students will be notified when they can collect or view their marked assessment. In accordance with University Policy marked assessments will usually only be held for 21 days after the declaration of marks for that assessment.

Retention

The university may retain copies of student work in order to facilitate quality assurance of assessment processes, in support of the continuous improvement of assessment design, assessment marking and for the review of the subject. The University retains records of students' academic work in accordance with the University Records Management Policy and the State Records Act 1988 and uses these records in accordance with the University Privacy Policy and the Privacy and Personal Information Protection Act 1998.

Scaling

Marks awarded for any assessment task or part of any assessment task, including an examination may be subject to scaling at the end of the session. Marks will be scaled only when unpredicted circumstances occur and in order to ensure fairness of marking across groups of students. The method of scaling will depend on the type of scaling required by the circumstances. When scaling is deemed necessary, it will follow a detailed consideration by the Unit Assessment Committee and/or the Faculty Assessment Committee of the marks of the group of students concerned. Scaling will not affect any individual student's rank order within their cohort. For more information please refer to [Finalisation of Student Results Policy](#) for details.

Supplementary Assessment

Supplementary assessment may be offered to students whose performance in this subject is close to that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. For information about eligibility criteria and the form and timing of supplementary assessments see the [Supplementary Assessment Procedure](#)

Review and Appeal of Academic Decisions

A student may request an explanation of a mark for an assessment task or a final grade for a subject consistent with the student's right to appropriate and useful feedback on their performance in an assessment task. A student may also seek further explanation for other academic decisions such as Academic Consideration, Supplementary Assessment or Credit for Prior Learning. If a student is not satisfied with the explanation, or have further concerns, they may have grounds for a formal review. For further information refer to [Review and Appeal of Academic Decisions Policy](#)

Assessment Quality Cycle

The UOW Assessment Quality Cycle provides a level of assurance that assessment practices across the University are appropriate, consistent and fair. Quality assurance activities are undertaken to support the continuous improvement of assessment and promote good practices in relation to assessment design, marking and review of the subject prior to subsequent delivery.

Academic Integrity

The University's Academic Integrity Policy, faculty handbook and subject guides clearly set out the University's expectation that students submit only their own original work for assessment and avoid plagiarising the work of others or cheating. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement. Plagiarism can be detected and has led to students being expelled from the University.

The use by students of any website that provides access to essays or other assessment items (sometimes marketed as 'resources'), is extremely unwise. Students who provide an assessment item (or provide access to an assessment item) to others, either directly or indirectly (for example by uploading an assessment item to a website) are considered by the university to be intentionally or recklessly helping other students to cheat. Uploading an assessment task, subject outline or other course materials without express permission of the University is considered academic misconduct and students place themselves at risk of being expelled from the University.

Students should visit the following University website and become familiar with the University's policy on plagiarism [Academic Integrity Policy](#)

Referencing

The Author-Date (Harvard) referencing system should, unless otherwise specified for a particular assessment (check Details of Assessment Tasks), be utilised. A summary of the Harvard system can be accessed on the Library website at: <http://uow.libguides.com/refcite>

Section C: General Advice for Students - Policies and Procedures

Student Services and Support

There are a range of services available to students that are provided free of charge. A good place to get to know services that may be of use to you is the [Get Started @ UOW](#) or search for "Get Started @ UOW". Services available include:

| Service | Link to information about the service |
|---|---|
| Aboriginal & Torres Strait Islander | https://www.uow.edu.au/about/services/woolyungah-indigenous-centre/about-us/ |
| Careers advice | https://www.uow.edu.au/student/careers/ |
| Counselling | https://www.uow.edu.au/student/support-services/counselling/ |
| Student Accessibility and Inclusion (SAI) | https://www.uow.edu.au/student/support-services/sai/ |
| Information Tech. | https://www.uow.edu.au/its/index.html?ssSourceSiteId=getstarted |
| Study Skills | https://www.uow.edu.au/student/support-services/academic-skills/ |

Student Support Coordinator (SSC)

If you have a temporary or ongoing issue or a problem that is affecting your study, including issues that are related to belonging to an equity group, then the Student Support Coordinators may be able to help. There are Student Support Coordinators available to assist students who are studying at all UOW Campuses and in all UOW Faculties. Contact details can be found on the UOW website: <https://www.uow.edu.au/student/support-services/coordinators/>

Student Advocacy Service

The Student Advocacy Service (SAS) is free, confidential and independent service for all UOW students. The SAS provides advocacy and referral for a range of academic, procedural and administrative issues. For more information visit: <https://www.uow.edu.au/student/support-services/advocacy/>

AskUOW

AskUOW is your primary administrative and information contact during your studies.

Our purpose is to ensure students have access to the information they need, at the time they need it. We can help with a wide range of enquiries, including key topics such as:

- Applying for [academic consideration](#)
- Fees and scholarships
- Official documentation and student letter requests
- Student forms such as course transfer and leave of absence applications
- Student ID card issuance and replacement
- Subject enrolment
- Transport concession cards and Opal cards
- Updating personal details

Get instant answers 24/7 online using [AskUOW](#). Log in with your UOW username and password.

For further support contact askuow@uow.edu.au or call on 1300 275 869 (1300 ASK UOW) or +61 2 4221 3927.

Library Services

Save yourself time and enhance your studies: connect with information specialists and resources anytime, anywhere.

- For Library support connect with [Live Chat](#) or [contact the Library](#).
- For self-help see [Frequently Asked Questions](#) or browse [Library guides](#) to find information, databases and skills tutorials.
- [Research consultations](#) are available to UOW Postgraduate, Honours and Deans Scholar students.

Academic Integrity Policy

Academic integrity involves upholding ethical standards in all aspects of academic work, including learning, teaching and research. It involves acting with the principles of honesty, fairness, trust and responsibility and requires respect for knowledge and its development. The Policy can be found at:

<https://policies.uow.edu.au/document/view-current.php?id=26>

Code of Practice - Research

This Code mandates the current policy and best practice relating to procedures for responsible research. The Code can be found at: <https://policies.uow.edu.au/document/view-current.php?id=11>

Honours Policy

This policy sets out the responsibilities of all parties involved in managing students undertaking Honours Programs. The Code can be found at: <https://policies.uow.edu.au/document/view-current.php?id=36>

The Code of Practice - Work Integrated Learning (Professional Experience)

The Code of Practice - Work Integrated Learning (Professional Experience) sets out what is expected from students, the University and Host Organisations in providing work integrated learning professional experience programs. It applies to professional experience programs that form the whole or part of a subject or course offered at the University. The Code assists in promoting a productive work integrated learning experience for students and in promoting relevant UOW Work Integrated Learning Design Principles.

<https://policies.uow.edu.au/document/view-current.php?id=12>

Copyright Policy

The purpose of this Policy is to outline responsibilities and procedures regarding the use of third party copyright material, with the objectives of reducing staff and UOW exposure to the risks associated with the use of third party copyright material, assisting staff to make full legal use of the materials at their disposal by clearly identifying responsibilities and promoting copyright compliance. The Policy can be found at:

<https://policies.uow.edu.au/document/view-current.php?id=135>

Course Progress Policy

The Course Progress Policy establishes the requirements, definitions and procedures to be used in determining the standards of acceptable course progress. The Policy can be found at:

<https://policies.uow.edu.au/document/view-current.php?id=30>

Examination Rules and Procedures

The UOW rules and procedures outline exam conditions, student conduct in exams, and the procedures for exam management. Further information can be found here: <https://www.uow.edu.au/student/exams/>

Ethical Objection by Students to the Use of Animal and Animal Products in Coursework Subjects

This policy provides a framework for recognition of and responses to students' ethical or religious objection to animal use in coursework subjects at the University of Wollongong. For the purpose of this policy, animal use includes killing of animals in experimental work, dissection of animals that are already dead, use of animal tissues, use of animal-derived products (such as sera). These uses are relevant to teaching and assessment. Further information about this policy can be found here: <https://policies.uow.edu.au/document/view-current.php?id=154>

Coursework Rules

The Coursework Rules (hereafter the Rules) govern the admission, enrolment, progression through, and qualification for a coursework award offered by the University. Further information can be found here: <https://policies.uow.edu.au/document/view-current.php?id=4>

Human Research Ethics

The Human Research Ethics Committee protects the welfare and rights of the participants in research activities. Further information can be found here: <https://www.uow.edu.au/research-and-innovation/researcher-support/ethics/human-ethics/>

Inclusive Language Guidelines

UOW endorses a policy of non-discriminatory language practice in all academic and administrative activities of the University. Further information is available from: <https://policies.uow.edu.au/document/view-current.php?id=239>

Intellectual Property Policy

UOW's IP Intellectual Property Policy provides guidance on the approach taken to Intellectual Property (IP), including its ownership, protection and exploitation. Further information about the management of IP is available at <https://policies.uow.edu.au/document/view-current.php?id=146>

Review and Appeal of Academic Decisions Policy

UOW aims to provide a transparent and consistent process for resolving a student concern about an academic decision that has affected their academic progress, including a mark or grade. Further information is available at: <https://policies.uow.edu.au/document/view-current.php?id=40>

Student Academic Consideration Policy

The purpose of the Student Academic Consideration Policy is to enable student requests for academic consideration for assessable components of a subject to be evaluated in a fair, reasonable, timely and consistent manner throughout the University. **For information on the Policy, eligibility and how to apply see:** <https://www.uow.edu.au/student/admin/academic-consideration/>

The Student Charter - Your Rights and Responsibilities

The Student Charter is based on principles that guide all members of the University and that promote responsible partnerships within and beyond the University community. <https://www.uow.edu.au/student/charter/>

Student Assignment of Intellectual Property (IP) Policy

This policy applies to all Students (under-graduate and post-graduate) of the University of Wollongong (UOW). It may also apply to other persons by agreement. This policy sets out the approach taken by UOW in relation to Student assignment of intellectual property. Further information about this policy can be found here: <https://policies.uow.edu.au/document/view-current.php?id=146>

Student Conduct Rules

These Rules outline the required conduct of students of UOW, and direct staff and students to University Rules, standards, codes, policies, guidelines, procedures and other requirements which specify acceptable and unacceptable student conduct, and the management of alleged student misconduct.

<https://policies.uow.edu.au/document/view-current.php?id=6>

Teaching and Assessment: Assessment and Feedback Policy

The purpose of this Policy is to set out the University of Wollongong's approach to effective learning, teaching and assessment, including the principles and minimum standards underlying teaching and assessment practice.

The Policy can be found at: <https://policies.uow.edu.au/document/view-current.php?id=38>

Teaching and Assessment: Code of Practice - Teaching

This Code is a key document in implementing the University's Teaching and Assessment Policy and sets out the specific responsibilities of parties affected in relation to learning, teaching and assessment, as well as procedures for teaching staff. The Code can be found at: <https://policies.uow.edu.au/document/view-current.php?id=9>

Teaching and Assessment: Subject Delivery Policy

This Policy sets out specific requirements in relation to the delivery of Subjects. The policy can be found at:

<https://policies.uow.edu.au/document/view-current.php?id=39>

Workplace Health & Safety Policy

The Workplace Health and Safety (WHS) unit at UOW aims to provide structures, system and support to ensure the health, safety and welfare of all at the campus. Further information is available from:

<https://policies.uow.edu.au/document/view-current.php?id=177>