

CHEM1120: Chemistry for the Life Sciences II

Ourimbah

Semester 2 - 2023



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description

Often referred to as a 'Central Science', Chemistry is the study of chemicals and chemical processes that underpin physical and biological phenomena. Chemistry impacts and interacts with our lives on a daily basis, including the food we eat, the medicine we take, and the energy we use.

This course focuses on the foundation concepts of chemistry and will introduce the chemistry of organic and inorganic compounds, and illustrates basic physical concepts central to an understanding in the discipline.

This is the second of two foundation subjects in the key scientific discipline of chemistry, providing core knowledge in science, engineering, human nutrition and the life sciences.

Requisites

This course has similarities to CHEM1020. If you have successfully completed CHEM1020 you cannot enrol in this course.

Assumed Knowledge

Fundamental concepts developed in CHEM1110 are extended in CHEM1120. It is assumed that students undertaking CHEM1120 have taken CHEM1110 (or equivalent). Students with prior learning in high school chemistry (or equivalent alternate study, such as Open Foundation) will have sufficient background to undertake this course.

Contact Hours

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Laboratory *

Face to Face On Campus

2 hour(s) per Week for 6 Weeks

Lecture

Face to Face On Campus

3 hour(s) per Week for Full Term

Workshop *

Face to Face On Campus

2 hour(s) per Week for 4 Weeks

Unit Weighting Workload

* This contact type has a compulsory requirement.

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Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

www.newcastle.edu.au

CRICOS Provider 00109J

CONTACTS

Course Coordinator	Ourimbah Dr Glenn Bryant Glenn.Bryant@newcastle.edu.au Consultation: Please email for an appointment.
Teaching Staff	Other teaching staff will be advised on the course Canvas site.
School Office	School of Environmental and Life Sciences SO-104 / SO-105 Science Offices OURIMBAH Science-SELS@newcastle.edu.au 4349 4568 / 4348 4115 9am-5pm (Mon-Fri)

SYLLABUS

Course Content	The course involves study of the following topics, illustrated as appropriate with relevant examples from applicable areas: Concepts in Physical Chemistry <ul style="list-style-type: none">• enthalpy, entropy, free energy & calorimetry, equilibrium, kinetics, acids & bases Concepts in Bioorganic Chemistry <ul style="list-style-type: none">• carbohydrates & biopolymers, amino acids & proteins, chirality Inorganic Chemistry <ul style="list-style-type: none">• transition metals & coordination chemistry, metals in bioorganic systems
Course Learning Outcomes	On successful completion of this course, students will be able to: <ol style="list-style-type: none">1. Describe and apply foundational concepts in chemistry;2. Describe and apply foundational physical chemical principles as they apply to kinetics, energy, and acidity;3. Recognise, identify, name and cite examples of bioorganic compounds, their reactions and characteristics;4. Apply the scientific method, namely, employ systematic observation, measurement and experimentation, and the formulation, testing and modification of hypotheses in the conduct and reporting of experiment results;5. Implement safe laboratory practice, including wearing of appropriate personal protective equipment, safe handling of chemicals and laboratory equipment and safe disposal of chemicals according to the relevant safety data sheets (SDS).
Course Materials	Lecture Materials: <ul style="list-style-type: none">- Lecture slides and recordings- Laboratory report templates- Tutorial and Workshop problems and solutions- Workshop assessment and practice quizzes Other Resources: <ul style="list-style-type: none">- Peer Assisted Study Session (PASS) provide a platform for you to compare notes, discuss difficult concepts and review weekly material with other students. Sessions are led by a trained PASS leader who previously received great grades in your course. It's free, it's proven to work, and it's for everyone – you don't even need to book ahead, just turn up! Students can contact PASS, or find out more about PASS here: http://www.newcastle.edu.au/service/student-support/pass/

Recommended Text:

- Blackman, Bottle, Schmid, Mocerino, Chemistry, Wiley, 2nd - 4th ed. or 5th ed.

Required Reading:

- All students are expected to read the relevant sections of the text that relate to the topics outlined in the lecture schedule or in laboratory notes. Laboratory notes must be read prior to attending laboratory sessions. Tutorial questions for each chapter should be attempted to improve competency.

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

- Laboratory There is a compulsory attendance requirement in this course. Students may only miss 1 laboratory session.
- Laboratory Induction Requirement - Students must attend and pass the induction requirements before attending these sessions.
- Workshop There is a compulsory attendance requirement in this course. Students may only miss 1 workshop session

Course Assessment Requirements:

- Assessment 2 - Tutorial / Laboratory Exercises: Pass Requirement - Students must pass this assessment item to pass the course.
- Assessment 2 - Tutorial / Laboratory Exercises: Attempt / Submission Requirement - Students must attempt/submit this assessment item to pass the course.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	17 Jul	Transition Metals	Lecture Laboratory Induction	Compulsory Safety Quiz
2	24 Jul	Coordination Compounds	Lecture Laboratory: Expt 5 - Synthesis of a Coordination Complex	
3	31 Jul	Colligative Properties	Lecture Workshop 1	Experiment 5 Report
4	7 Aug	Revision Quiz 1	No Lecture Laboratory: Expt 1 - Calorimetry	Workshop 1 Quiz Quiz 1
5	14 Aug	Thermodynamics: Enthalpy, calorimetry, entropy and free energy	Lecture Laboratory: Expt 2 - Chemical Kinetics	Experiment 1 Report
6	21 Aug	Reaction Kinetics	Lecture Workshop 2	Experiment 2 Report
7	28 Aug	Chemical Equilibrium	Lecture Laboratory: Expt 4 - pH, Indicators & Acid-Base Titration	Workshop 2 Quiz
8	4 Sep	Acids and Bases	Lecture No Laboratory	Experiment 4 Report
9	11 Sep	Chirality	Workshop 3	
10	18 Sep	Revision Quiz 2	No Lecture Laboratory - Online: Expt 6 - Organic Conformers	Workshop 3 Quiz Quiz 2
Mid Term Break				
Mid Term Break				
11	9 Oct	Amino Acids and Proteins	Lecture Laboratory: Expt 7 - Isolation of a Protein	Experiment 6 Report
12	16 Oct	Carbohydrates	Lecture Workshop 4	Experiment 7 Report
13	23 Oct	Final Exam	No lecture No laboratory/workshop	Workshop 4 Quiz Final Exam
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Final Examination	Week 13	Individual	20%	1, 2, 3
2	Laboratory reports*	1 week after each session.	Individual	20%	1, 2, 3, 4, 5
3	Problem solving workshops	1 week after each session.	Individual	20%	1, 2, 3
4	Mid Semester Quizzes (2)	Weeks 4 & 10	Individual	40%	1, 2, 3

* This assessment has a compulsory requirement.

Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Final Examination

Assessment Type	In Term Test
Purpose	The final examination is designed to test the individual student's knowledge of the entire course material and their ability to describe, analyse and hypothesise from this material.
Description	<p>The final exam consists of multiple-choice questions and is to be completed under one of the following two scenarios:</p> <p>Scenario 1: Students use marks already obtained from the mid semester assessments and only complete section 3 of the final exam with a weight of 20%.</p> <p>Scenario 2: Students re-sit the mid semester exams along with final exam component and complete sections 1 and/or 2, and 3 of the final exam with a weight of 20% per section. The best result obtained for each mid semester component will be taken.</p> <p>The exam will be held during the 2-hour lecture session of Week 13</p>
Weighting	20%
Length	120 minutes
Due Date	Week 13
Submission Method	In Class
Assessment Criteria	Assesses the entire course material from lectures, workshop and laboratory components of the course.
Return Method	Not Returned
Feedback Provided	No Feedback.

Assessment 2 - Laboratory reports

Assessment Type	Tutorial / Laboratory Exercises
Purpose	The purpose of laboratory work is to introduce students to the practical aspects of chemistry. Students develop skill working both alone and in group situations and is designed to improve peer-to-peer learning, develop oral communication skills and hone the ability to record data and synthesise opinion.
Description	The successful completion of laboratory work in CHEM1120 is mandatory to achieve a pass in the course. Laboratory reports are completed for each individual laboratory exercise. All reports are collected and from this total, four (4) are used to award a grade. Marked reports are returned to students as soon as possible after marking. In some cases this may extend beyond the 2-week turn around period recommended by the university. See additional information for further details.
Weighting	20%

Compulsory Requirements	Pass Requirement - Students must pass this assessment item to pass the course.. Attempt / Submission Requirement - Students must attempt/submit this assessment item to pass the course.
Due Date	1 week after each session.
Submission Method	In Class
Assessment Criteria	Marks are awarded for responses to pre- and post-lab questions, laboratory results and analysis, and, where applicable, accuracy.
Return Method	In Person
Feedback Provided	Returned Work. Additional verbal feedback provided during lab/workshop sessions or via appointment.
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment. A make-up laboratory session will be offered at the end of semester.

Assessment 3 - Problem solving workshops

Assessment Type	Case Study / Problem Based Learning
Purpose	Designed to help students gain a greater understanding of core concepts in first year chemistry. Students will learn to effectively answer exam and laboratory based questions by developing a logical step-wise process when tasked with this style of assessment.
Description	These sessions will be completed in small groups and will be peer-assisted. Assessment will be based on level of participation and a Canvas quiz available for at least one week following each session.
Weighting	20%
Due Date	1 week after each session.
Submission Method	Online via Canvas
Assessment Criteria	Marks awarded for responses to a short quiz following each session and class participation of the entire session.
Return Method	Not Returned
Feedback Provided	In Class. Feedback provided during lab/workshop sessions or via appointment.

Assessment 4 - Mid Semester Quizzes (2)

Assessment Type	Quiz
Purpose	Examines the first two blocks of CHEM1120 content (weeks 1-3 & 5-8) during the semester in order to assimilate the course material more effectively.
Description	This requires students to keep up to date with the lecture and workshop content presented. Quizzes are multiple-choice and/or short answer format and are of 1 hour duration. The quiz will be held during the lecture sessions of Weeks 4 & 10
Weighting	40%
Length	1 hour each
Due Date	Weeks 4 & 10
Submission Method	In Class
Assessment Criteria	Assessed on course material from weeks 1-3 & 5-8 respectively
Return Method	Not Returned
Feedback Provided	In Class. Feedback provided during lab/workshop sessions or via appointment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit	Good standard indicating a high level of knowledge and

	(C)	understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Attendance

Attendance/participation will be recorded in the following components:

- Laboratory (Method of recording: Check-in via myUoN & Class Roll)
- Workshop (Method of recording: Check-in via myUoN & Class Roll)

WH&S Requirements

Mandatory laboratory safety induction sessions will take place during the first week of Semester. This is a compulsory element of laboratory work that must be completed by all students enrolling in CHEM1120. Students must successfully complete the safety induction to be allowed to enter the chemistry laboratory to commence work.

Students are required to have basic personal protection equipment (PPE) from week 1. This consists of:

- Laboratory coat
- Completely enclosed shoes
- Long pants
- Approved safety glasses

PPE must be worn at all times while working in the laboratory. Students who fail to comply with this policy will not be granted access to the laboratory.

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the

online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at

<https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures> that support a safe and respectful environment at the University.

Other Information

Additional Information on Laboratory Sessions

Students undertaking CHEM1120 are required to demonstrate practical and theoretical competency in laboratory chemistry by:

- participating in a minimum of 5 out of 6 laboratory sessions and 3 out of 4 workshops;
- obtaining an overall passing grade of at least 50% in the laboratory component of the course.

Students who are absent from a laboratory exercise are requested to notify the Course Coordinator, and provide documentary evidence (if required) to explain the absence.

Students with RAPs should also notify the Course Coordinator if they missed a lab or quiz.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

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