UNSW Course Outline

ZPEM2102 Organic Chemistry 2 - 2024

Published on the 11 Feb 2024

General Course Information

Course Code : ZPEM2102
Year : 2024
Term : Semester 1
Teaching Period : Z1
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : UC Science
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Organic Chemistry covers the reactions, structures and synthesis of molecules that have a carbon-based backbone. These materials form the basis of all known life, most pharmaceuticals and a wide range of materials. In this course, we look at the skills that chemists need to

determine the structure of the compounds that they have isolated or prepared; how to determine the way they will react; and introduce strategies used in synthesis. We introduce methods for structure determination such as Nuclear Magnetic Resonance (NMR) and infra-red (IR) and more. Organic reaction mechanisms are investigated using traditional functional groups and reagents, and an understanding of the chemical driving forces that lead to particular products will be gained.

Course Aims

The aim of Organic Chemistry 2 is to provide the necessary platform for the level 3 courses, in particular explosives, supramolecular chemistry and biological chemistry.

Relationship to Other Courses

Level 1= Chemistry 1A and Chemistry 1B.

Level 2 = Organic Chemistry 2 (6 UoC), Inorganic and Spectroscopic Chemistry (6 UoC) and Biological Chemistry (6 UoC).

Level 3 = Explosives (6 Uoc), Applications of Quantum Theory (6 UoC) and Supramolecular Chemistry (6 UoC).

Organic Chemistry 2 provides the necessary platform for several following courses, in particular – explosives, supramolecular chemistry and biological chemistry.

The assumed knowledge for the course is the material taught in the level 1 courses Chemistry 1A and 1B.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Students will be able to determine the structure of simple molecules using NMR and IR data
CLO2 : Students will be able to identify Lewis acid (Electrophilic) and Lewis base (Nucleophilic) sites in molecules
CLO3 : Students will demonstrate a range of reaction mechanisms using this information
CLO4 : Students will be able to use co-ordinate diagrams to explain and rationalise reactions.
CLO5 : Students will be able to discriminate between formation of an intermediate Vs transition state in a reaction
CLO6 : Students will be able to use their accumulated knowledge to plan many-step (approximately 4) synthetic sequences.

Course Learning Outcomes	Assessment Item
CLO1 : Students will be able to determine the structure of simple molecules using NMR and IR data	• Laboratory which is made up of 6 individual exercises • Final Exam • Assignment
CLO2 : Students will be able to identify Lewis acid (Electrophilic) and Lewis base (Nucleophilic) sites in molecules	• Class tests • Laboratory which is made up of 6 individual exercises
CLO3 : Students will demonstrate a range of reaction mechanisms using this information	• Final Exam • Class tests • Laboratory which is made up of 6 individual exercises
CLO4 : Students will be able to use co-ordinate diagrams to explain and rationalise reactions.	• Final Exam • Class tests • Laboratory which is made up of 6 individual exercises
CLO5 : Students will be able to discriminate between formation of an intermediate Vs transition state in a reaction	• Final Exam • Class tests • Laboratory which is made up of 6 individual exercises
CLO6 : Students will be able to use their accumulated knowledge to plan many-step (approximately 4) synthetic sequences.	• Class tests • Laboratory which is made up of 6 individual exercises

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

Attending lectures is an integral part of the learning process as face-to-face lectures with tutorial style explanations as we progress through a topic helps you to understand the concepts required to predict which functional groups will react under what chemical circumstances and what products will be produced. Additional help can also be sort by appoitment from the lecturer giving the topic.

Each test following the completion of a topic helps you to track your own personal progress and understanding of the topic. The tests are marked relatively quickly and a follow up tutorial also gives you early feedback.

The laboratory excerises are as closely as possible aligned with the theory to help reenforce the

concepts, however, the laboratory exercises on their own are an important part of the organic chemistry course. Practical laboratory skills can only be obtained by physically performing the experiments. Technical manipulation or chemicals and equipment and then the ananysis through instrumentation are all important laboratory skills.

THE USE OF AI

SIMPLE EDITING ASSISTANCE For this assessment task, you may use standard editing and referencing software, but not generative AI. You are permitted to use the full capabilities of the standard software to answer the question.

If the use of generative AI such as ChatGPT is detected, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

Additional Course Information

Organic chemistry is a very broad topic but this course will provide a good understanding of the fundamentals of organic chemical reactions and reactivity. The in-depth examination of select examples provides the essential tools and knowledge required for dealing with this ever-expanding field.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Laboratory which is made up of 6 individual exercises	20%	
Final Exam	30%	
Class tests	40%	
Assignment	10%	

Assessment Details

Laboratory which is made up of 6 individual exercises

Assessment Overview

marked lab reports

Course Learning Outcomes

- CLO1 : Students will be able to determine the structure of simple molecules using NMR and IR data
- CLO2 : Students will be able to identify Lewis acid (Electrophilic) and Lewis base (Nucleophilic) sites in molecules
- CLO3 : Students will demonstrate a range of reaction mechanisms using this information
- CLO4 : Students will be able to use co-ordinate diagrams to explain and rationalise reactions.
- CLO5 : Students will be able to discriminate between formation of an intermediate Vs transition state in a reaction
- CLO6 : Students will be able to use their accumulated knowledge to plan many-step (approximately 4) synthetic sequences.

Detailed Assessment Description

There are six individual practical exercises. **All assessable work must be submitted one week after the exercise is completed. The assessment for the first five laboratory classes will total 15 of the 20 marks for the laboratory component. The final laboratory will be worth the remaining 5 marks.**

Laboratory classes are on:

- Monday (2.00 to 6.00 pm)
- Tuesday (2.00 to 6.00 pm)

in weeks 3, 4, 6, 8, 10 and 12.

Final Exam

Assessment Overview

Comprehensive examination

Course Learning Outcomes

- CLO1 : Students will be able to determine the structure of simple molecules using NMR and IR data
- CLO3 : Students will demonstrate a range of reaction mechanisms using this information
- CLO4 : Students will be able to use co-ordinate diagrams to explain and rationalise reactions.
- CLO5 : Students will be able to discriminate between formation of an intermediate Vs transition state in a reaction

Class tests

Assessment Overview

Marked class tests

Course Learning Outcomes

- CLO2 : Students will be able to identify Lewis acid (Electrophilic) and Lewis base (Nucleophilic) sites in molecules
- CLO3 : Students will demonstrate a range of reaction mechanisms using this information
- CLO4 : Students will be able to use co-ordinate diagrams to explain and rationalise reactions.
- CLO5 : Students will be able to discriminate between formation of an intermediate Vs transition state in a reaction
- CLO6 : Students will be able to use their accumulated knowledge to plan many-step (approximately 4) synthetic sequences.

Detailed Assessment Description

Class Test 1 (10%) Friday 22 March

Class Test 2 (10%) Monday 22 April

Class Test 3 (10%) Wednesday 8 May

Class Test 4 (10%). Friday 24 May

Assessment information

Note: A 5th class test will be given as exam preparation. The mark obtained in this test can substitute for any one of the previous four tests in the event that the score this test is higher.

Assignment

Assessment Overview

Marked assignment

Course Learning Outcomes

- CLO1 : Students will be able to determine the structure of simple molecules using NMR and IR data

Detailed Assessment Description

For this assessment task, you may use standard editing and referencing software, but not generative AI. You are permitted to use the full capabilities of the standard software to answer the question.
If the use of generative AI such as ChatGPT is detected, it will be regarded as serious academic misconduct and subject to the standard penalties, which may include 00FL, suspension and exclusion.

General Assessment Information

Late laboratory reports or assignments will only be accepted if prior arrangement is made with the lecturer, or a formal application for special consideration is submitted.

Grading Basis

Standard

Requirements to pass course

Both the theory and laboratory components of this course are considered essential. Consequently where a student passes the theory component but not the laboratory component and the total composite mark is greater than 46%, a grade of UF (unsatisfactory performance in an essential component of the course) will apply, even if the final mark is 50% or higher. Similarly where the laboratory component is passed, but not the theory component, again a grade of UF will be recorded where the total composite mark is greater than 46%. Below 46%, in both cases, a fail grade will be recorded.

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is **the only official mark.**

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Lecture	Lectures begin
Week 2 : 4 March - 8 March	Lecture	Continuing until week 13
Week 3 : 11 March - 15 March	Laboratory	Laboratory classes 2:00 -6:00 Monday/Tuesday. Alternate day required for Monday class to be discussed in class First Exercise – Spectroscopic Analysis Assignment handed out 15th March
Week 4 : 18 March - 22 March	Laboratory	Laboratory classes 2:00 - 6:00 Monday/Tuesday 2 nd Exercise – HyperChem Molecular Modelling Class test 1 – 22nd March
Week 5 : 25 March - 29 March	Lecture	Easter Friday no lecture
Week 6 : 1 April - 5 April	Laboratory	Laboratory classes 2:00 - 6:00 Monday/Tuesday 3 rd Exercise – Synthesis of Aspirin and Oil of Wintergreen Alternate day required for Monday class due t Easter, to be discussed in class. Monday lecture lost
Week 7 : 22 April - 26 April	Assessment	2nd In Class test - 22nd April
Week 8 : 29 April - 3 May	Laboratory	Laboratory classes 2:00 - 6:00 Monday/Tuesday 4 th Exercise – Synthesis using a Grignard Reagent
Week 9 : 6 May - 10 May	Assessment	In Class test 8th May
Week 10 : 13 May - 17 May	Laboratory	Laboratory classes 2:00 - 6:00 Monday/Tuesday 4 th Exercise – A Chemical Puzzle
Week 11 : 20 May - 24 May	Assessment	In Class test – 24th May
Week 12 : 27 May - 31 May	Laboratory	Laboratory classes 2:00 - 6:00 Monday/Tuesday 6 th Exercise – An Organic Acid Catalyst Alternate day required – Monday class transfers to Tuesday and an alternate day for Tuesday will be to be discussed in class.
Week 13 : 3 June - 7 June	Assessment	Option in class test – an opportunity to test your overall undersatnding of the course in preparation for the final exam. 5th June

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

The 34 lecture period course is composed of 17 lectures, 13 student-centred workshops and 5 test periods. In addition, there are 6 laboratory sessions all face-to-face. The lectures/tutorials are approximately structured as follows:

Lecture Periods:

Topic

1-2 Revision of Organic Chemistry from Chemistry 1A.

3-7 Chapter 9 (spectroscopic analysis of organic compounds).

8-18 Chapters: 1 + 4 (alkanes and conformational analysis), 5 (stereochemistry), 6 (ionic reactions), 7 + 8 (alkenes, alkynes and conjugated unsaturated systems).

19-31 Chapters 14 + 15 (aromatic compounds and their reactions), 10 + 11 (alcohols and ethers), 16 +17 (aldehydes and ketones), 18 (carboxylic acids).

32-34 The course concludes with several lectures on retro-synthetic analysis

Course Resources

Prescribed Resources

Textbook: *Graham Solomons & Craig Fryhle, "Organic Chemistry 11or 12th ed." John Wiley & sons, Inc.*

We strongly recommend that you obtain a copy of this textbook as we continually refer to it for examples and reading. Of course, a range of other books is available covering Organic Chemistry, and you are encouraged to use these to help clarify difficulties you may have.

Course notes: *these will be available before lectures on Moodle and current lectures will also be available on Echo 360.*

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of this course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the "On-going Student Feedback" link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups. Student opinions really do make a difference. Refer to the Moodle site for this course to see how the feedback from previous students has contributed to the course development.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Anthony Day		220 Building 22	VOIP 0251145041	during working hours (appointment by email)	No	Yes
Lecturer	Tristan Reekie		214 Building 22	VOIP 0251145067	during working hours (appointment by email)	No	No

Other Useful Information

Academic Information

Course Evaluation and Development

One of the key priorities in the 2025 Strategy for UNSW is a drive for academic excellence in education. One of the ways of determining how well UNSW is progressing towards this goal is by listening to our own students. Students will be asked to complete the myExperience survey towards the end of each course.

Students can also provide feedback during the semester via: direct contact with the lecturer, the “On-going Student Feedback” link in Moodle, Student-Staff Liaison Committee meetings in schools, informal feedback conducted by staff, and focus groups (where applicable). Student opinions really do make a difference. Refer to the Moodle site for your course to see how the feedback from previous students has contributed to the course development.

Important note: Students are reminded that any feedback provided should be constructive and professional and that they are bound by the Student Code of Conduct.

https://www.gs.unsw.edu.au/policy/documents/studentcodepolicy.pdf

Equitable Learning Services (ELS)

Students living with neurodivergent, physical and/or mental health conditions or caring for someone with these conditions may be eligible for support through the Equitible Learning Services team. Equitable Learning Services is a free and confidential service that provides practical support to ensure your mental or physical health conditions do not adversely affect your studies.

Our team of dedicated **Equitable Learning Facilitators** (ELFs) are here to assist you through this process. We offer a number of services to make your education at UNSW easier and more equitable.

Further information about ELS for currently enrolled students can be found at: https://www.student.unsw.edu.au/equitable-learning

Academic Honesty and Plagarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW staff and students have a responsibility to adhere to this principle of academic integrity. All students are expected to adhere to UNSW's Student Code of Conduct. Find relevant information at: Student Code of Conduct (unsw.edu.au)

Plagiarism undermines academic integrity and is not tolerated at UNSW. It is defined as using the words or ideas of others and passing them off as your own, and can take many forms, from deliberate cheating to accidental copying from a source without acknowledgement.

For more information, please refer to the following:

https://student.unsw.edu.au/plagiarism

Submission of Assessment Tasks

Special Consideration

Special Consideration is the process for assessing and addressing the impact on students of short-term events, that are beyond the control of the student, and that affect performance in a specific assessment task or tasks.

Applications for Special Consideration will be accepted in the following circumstances only:

- Where academic work has been hampered to a substantial degree by illness or other cause;
- The circumstances are unexpected and beyond the student's control;
- The circumstances could not have reasonably been anticipated, avoided or guarded against by the student; and either:

(i) they occurred during a critical study period and was 3 consecutive days or more duration, or a total of 5 days within the critical study period; or

(ii) they prevented the ability to complete, attend or submit an assessment task for a specific date (e.g. final exam, in class test/quiz, in class presentation)

Applications for Special Consideration must be made as soon as practicable after the problem occurs and at the latest within three working days of the assessment or the period covered by the supporting documentation.

By sitting or submitting the assessment task the student is declaring that they are fit to do so and cannot later apply for Special Consideration (UNSW 'fit to sit or submit' requirement).

Sitting, accessing or submitting an assessment task on the scheduled assessment date, after applying for special consideration, renders the special consideration application void.

Find more information about special consideration at: https://www.student.unsw.edu.au/special/consideration/guide

Or apply for special consideration through your MyUNSW portal.

Late Submission of assessment tasks (other than examinations)

UNSW has a standard late submission penalty of:

- 5% per day,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Electronic submission of assessment

Except where the nature of an assessment task precludes its electronic submission, all assessments must be submitted to an electronic repository, approved by UNSW or the Faculty, for archiving and subsequent marking and analysis.

Release of final mark

All marks obtained for assessment items during the session are provisional. The final mark as published by the university following the assessment review group meeting is the only official

mark.