UNSW Course Outline

ZPEM3107 Explosives - 2024

Published on the 11 Feb 2024

General Course Information

Course Code : ZPEM3107
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

Diverse aspects of explosives chemistry are covered, beginning with an introduction to explosive reactions and basic methods of estimating performance. Synthesis and properties of organic high explosives are discussed, and the relationship between structure and reactivity is explored. Various analytical detection methods are examined in the context of trace analysis of hidden

explosives, including field methods, laboratory techniques and current research. The second part of the course concentrates on the physical processes occurring during initiation and explosion. Different methods for calculating detonation parameters and modelling explosive output are investigated. Factors affecting sensitivity are discussed, along with insensitive munitions.

Course Aims

The course covers diverse aspects of explosives chemistry, beginning with an introduction to explosive reactions and basic methods of estimating explosive performance. The synthesis and properties of organic high explosives are also examined, and the relationship between structure and reactivity is discussed. Detection methods and the problems of trace analysis are discussed. The second part of the course concentrates on the physical processes occurring during initiation and explosion. Different methods for calculating detonation parameters and modelling explosive output are investigated. Factors affecting sensitivity are also discussed, along with insensitive munitions.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Recognise molecular features and explain synthetic approaches and reaction mechanisms that can lead to explosive systems.
CLO2 : Explain the physical principles underlying several different methods of chemical analysis and critically evaluate their effectiveness in trace detection of explosives
CLO3 : Describe physical and chemical principles governing the kinetics of detonation and explosive reactions.
CLO4 : Carry out a range of thermochemical and thermodynamic calculations relating to explosive performance and interpret the results.

Course Learning Outcomes	Assessment Item
CLO1 : Recognise molecular features and explain synthetic approaches and reaction mechanisms that can lead to explosive systems.	• Class test 1 • Assignment Reports • Final exam
CLO2 : Explain the physical principles underlying several different methods of chemical analysis and critically evaluate their effectiveness in trace detection of explosives	• Class test 2 • Assignment Reports • Final exam
CLO3 : Describe physical and chemical principles governing the kinetics of detonation and explosive reactions.	• Assignment Reports • Final exam
CLO4 : Carry out a range of thermochemical and thermodynamic calculations relating to explosive performance and interpret the results.	• Class test 1 • Assignment Reports • Final exam

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360

Learning and Teaching in this course

Lectures on theory are supplemented by tutorials and workshops, which reinforce the concepts and methods under discussion and develop understanding of the calculations employed in this branch of chemistry. A Field School allows students to observe and analyse real explosive systems, and gain experience in practical applications and field-applicable detection methods.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Class test 1 Assessment Format: Individual	10%	Start Date: 27/03/2024 09:00 AM Due Date: 27/03/2024 09:50 AM
Class test 2 Assessment Format: Individual	15%	Start Date: 08/05/2024 09:00 AM Due Date: 08/05/2024 09:00 AM
Assignment Reports Assessment Format: Individual	35%	Start Date: As advised in Assessment Description Due Date: As advised in Assessment Description
Final exam Assessment Format: Individual	40%	Start Date: TBA (exam period) Due Date: TBA (exam period)

Assessment Details

Class test 1

Assessment Overview

Class test. Feedback provided through class tutorial

Course Learning Outcomes

- CLO1 : Recognise molecular features and explain synthetic approaches and reaction mechanisms that can lead to explosive systems.
- CLO4 : Carry out a range of thermochemical and thermodynamic calculations relating to explosive performance and interpret the results.

Detailed Assessment Description

This is a closed book class test held during the scheduled lecture slot.

Assessment Length

50 min

Assignment submission Turnitin type

Not Applicable

Class test 2

Assessment Overview

Class test. Feedback provided through class tutorial

Course Learning Outcomes

- CLO2 : Explain the physical principles underlying several different methods of chemical analysis and critically evaluate their effectiveness in trace detection of explosives

Detailed Assessment Description

This is a closed book class test held during the scheduled lecture slot.

Assessment Length

50 min

Assignment submission Turnitin type

Not Applicable

Assignment Reports

Assessment Overview

Practical exercises and workshops. Feedback given by return of reports.

Course Learning Outcomes

- CLO1 : Recognise molecular features and explain synthetic approaches and reaction mechanisms that can lead to explosive systems.
- CLO2 : Explain the physical principles underlying several different methods of chemical analysis and critically evaluate their effectiveness in trace detection of explosives
- CLO3 : Describe physical and chemical principles governing the kinetics of detonation and explosive reactions.
- CLO4 : Carry out a range of thermochemical and thermodynamic calculations relating to explosive performance and interpret the results.

Detailed Assessment Description

There are two assignment-style assessments in this course.

The Field School report (worth 25%) is due by COB on Monday 13 May.

The Assignment (worth 15%) is due by COB on Friday 7 June.

Both assessments must be submitted via Turnitin.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Final exam

Assessment Overview

2 hour final exam comprehensively assessing all theory components of the course

Course Learning Outcomes

- CLO1 : Recognise molecular features and explain synthetic approaches and reaction mechanisms that can lead to explosive systems.
- CLO2 : Explain the physical principles underlying several different methods of chemical analysis and critically evaluate their effectiveness in trace detection of explosives
- CLO3 : Describe physical and chemical principles governing the kinetics of detonation and explosive reactions.
- CLO4 : Carry out a range of thermochemical and thermodynamic calculations relating to explosive performance and interpret the results.

Detailed Assessment Description

Closed book exam held during final exam period with exact date to be advised later in semester.

Assessment Length

2 hours

Assignment submission Turnitin type

Not Applicable

General Assessment Information

Students can test their understanding of early concepts using tutorial-style questions provided, with selected answers provided in class along with lecturer feedback and explanations.

For assessment in this course you may use standard editing and referencing software, but not generative AI such as ChatGPT. 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.

Grading Basis

Standard

Requirements to pass course

Students must complete/submit all assessments, and must obtain 50% overall.

Course Schedule

Attendance Requirements

Attendance at the Field School, or any laboratory classes that may replace this if necessary, is compulsory.

In addition, students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Prescribed Resources

There is no prescribed/compulsory textbook for this course.

Recommended Resources

A list of useful texts, including links to the e-books in the Academy library, is provided on the Moodle site. Other resources, such as journal articles, will be posted on Moodle or provided as citations for students to access through the library.

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.

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 Policy*

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

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Lynne Wallace		Room 213, Science North (Building 22)	02 5114 5047	Usually available for consultation during normal working hours and via email.	No	Yes
Lecturer	Adrian Garrido Sanchis		Room 218, Science North (Building 22)	02 5114 5031	Usually available for consultation during normal working hours and via email.	No	No

Other Useful Information

Academic Information

Course Evaluation and Development

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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.