UNSW Course Outline

ZEIT8233 Explosive Ordnance Technology - 2024

Published on the 03 Jul 2024

General Course Information

Course Code : ZEIT8233
Year : 2024
Term : Semester 2
Teaching Period : Z2
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Engineering and Technology
Delivery Mode : Online
Delivery Format : Standard
Delivery Location : UNSW Canberra at ADFA
Campus : UNSW Canberra
Study Level : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Explosive Ordnance Technology begins with an examination of the chemical basis of energetic materials. Using the context of a regulatory framework it then examines the principles, characteristics and specific examples of explosive trains, explosive ordnance design, handling

and use, and acquisition, entry into service, storage and disposal. Finally it outlines current trends in explosive ordnance technology.

Course Aims

At the successful conclusion of this course students will be able to:

1. Analyse the thermochemistry of explosives and the properties of typical explosive compounds
2. Calculate the terminal effects of blast and fragmentation warheads
3. Identify the various methods and limitations associated with warhead fuzing systems
4. Evaluate the vulnerabilities of explosive systems throughout the capability lifecycle
5. Describe the trade-offs associated with weapon performance and accuracy including system safety compliance.

Relationship to Other Courses

"Terminal effects of blast and fragmentation warheads" is covered in-depth in ZEIT 8512 EO Effects

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.
CLO2 : Calculate the terminal effects of blast and fragmentation warheads.
CLO3 : Identify the various methods and limitations associated with warhead fuzing systems.
CLO4 : Evaluate the vulnerabilities of explosive systems throughout the capability lifecycle.
CLO5 : Describe the trade-offs associated with weapon performance and accuracy including system safety compliance.

Course Learning Outcomes	Assessment Item
CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.	• Quiz 3 • Quiz 2 • Capstone Assignment ZEIT8233 • Quiz 1
CLO2 : Calculate the terminal effects of blast and fragmentation warheads.	• Quiz 3 • Quiz 2 • Capstone Assignment ZEIT8233
CLO3 : Identify the various methods and limitations associated with warhead fuzing systems.	• Quiz 3 • Capstone Assignment ZEIT8233
CLO4 : Evaluate the vulnerabilities of explosive systems throughout the capability lifecycle.	• Quiz 3 • Capstone Assignment ZEIT8233
CLO5 : Describe the trade-offs associated with weapon performance and accuracy including system safety compliance.	• Capstone Assignment ZEIT8233

Learning and Teaching Technologies

Moodle - Learning Management System | Zoom

Learning and Teaching in this course

The lecture notes, videos will be uploaded on a weekly basis. In addition, there will be several Q&A online sessions before each assessment.

The Learning Management System

Moodle is the Learning Management System used at UNSW Canberra. All courses have a Moodle site which will become available to students at least one week before the start of semester.

Please find all help and documentation (including Blackboard Collaborate) at the Moodle Support page.

UNSW Moodle supports the following web browsers:

» Google Chrome 50+
» Safari 10+
** Internet Explorer is not recommended

** Addons and Toolbars can affect any browser's performance.

Operating systems recommended are:

Windows 7, 10, Mac OSX Sierra, iPad IOS10

For further details about system requirements click here.

Log in to Moodle here.

If you need further assistance with Moodle:

For enrolment and login issues please contact:
IT Service Centre
Email: itservicecentre@unsw.edu.au
Phone: (02) 9385-1333
International: +61 2 9385 1333

For all other Moodle issues please contact:
External TELT Support
Email: externalteltsupport@unsw.edu.au
Phone: (02) 9385-3331
International: +61 2 938 53331

Opening hours:
Monday – Friday 7:30am – 9:30 pm
Saturday & Sunday 8:30 am – 4:30pm

Additional Course Information

Highly Important: Please pay attention on the change of teaching strategies: This course is no

longer taught in the intensive mode, it is now changed to the normal online teaching mode (running through the entire semester 2).

Introduction of a Short Extension process

A new UNSW process enabling students to apply for a Short Extension on their assessment (other than examinations) deadline without the need to provide documentation. A short extension differs from Special Consideration in that no documentation is required and the length of the short extension is predetermined. All applications for a short extension must be submitted as early as possible before the assessment task deadline. No late applications submitted after the assessment task deadline will be accepted. Students who miss an assessment task deadline should refer to Special Consideration. Course convenors determine if each assessment task is eligible for a short extension prior to each term and, where eligible, elect the duration of one to seven days. A Special Consideration application is required for any further extension. Students with an applicable Equitable Learning Plan (ELP) are able to decide whether their ELP or the Short Extension best serves their unique needs on a case-by-case basis for each assessment task applicable for Short Extension. The assessment deadline is extended by either the ELP or the Short Extension period but not both. Short Extensions are referenced in section 5 of UNSW's Assessment Implementation Procedure.

Referencing

In this course, students are required to reference following the APA 7 / Chicago NB referencing style. Information about referencing styles is available at: https://guides.lib.unsw.adfa.edu.au/c.php?g=472948&p=3246720

Developing Graduate Capabilities

Successful completion of this course contributes to the acquisition of UNSW graduate capabilities. UNSW aspires to develop globally focused graduates who are **rigorous scholars**, capable of **leadership** and **professional practice** in an **international** community.

Class Attendance and Absence

Students are expected to attend all classes in the course in which they are enrolled. All requests for exemption from attendance or absence should be addressed to the Course Authority and where applicable, be accompanied by a medical certificate.

See University Rules at: https://student.unsw.edu.au/attendance

All Defence and Defence-funded students must also seek approval from relevant Defence authority for exemption from attendance or absence.

Academic Integrity and Plagiarism

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 Policy.

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

Study at UNSW Canberra

https://www.unsw.adfa.edu.au/study

Study at UNSW Canberra has lots of useful information regarding:

- Where to get help
- Administrative matters
- Getting your passwords set up
- How to log on to Moodle
- Accessing the Library and other areas.

Additional Information as required

CRICOS Provider no. 00098G
The University of New South Wales Canberra.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Quiz 3 Assessment Format: Individual Short Extension: Yes (3 days)	20%	Start Date: 23/09/2024 12:01 AM Due Date: 29/09/2024 11:59 PM Post Date: 23/09/2024 12:00 AM
Quiz 2 Assessment Format: Individual Short Extension: Yes (3 days)	20%	Start Date: 19/08/2024 12:01 AM Due Date: 25/08/2024 11:59 PM Post Date: 19/08/2024 12:00 AM
Capstone Assignment ZEIT8233 Assessment Format: Individual Short Extension: Yes (3 days)	40%	Start Date: Not Applicable Due Date: 27/10/2024 11:59 PM Post Date: 07/10/2024 12:00 AM
Quiz 1 Assessment Format: Individual Short Extension: Yes (3 days)	20%	Start Date: 29/07/2024 12:01 AM Due Date: 02/08/2024 11:59 PM Post Date: 29/07/2024 12:00 AM

Assessment Details

Quiz 3

Assessment Overview

Quiz 3

Course Learning Outcomes

- CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.
- CLO2 : Calculate the terminal effects of blast and fragmentation warheads.
- CLO3 : Identify the various methods and limitations associated with warhead fuzing systems.
- CLO4 : Evaluate the vulnerabilities of explosive systems throughout the capability lifecycle.

Detailed Assessment Description

Open book online quiz, one attempt only

Assignment submission Turnitin type

This is not a Turnitin assignment

Quiz 2

Assessment Overview

Quiz of CLO 1 and 2

Course Learning Outcomes

- CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.
- CLO2 : Calculate the terminal effects of blast and fragmentation warheads.

Detailed Assessment Description

Open book online quiz, one attempt only

Assignment submission Turnitin type

This is not a Turnitin assignment

Capstone Assignment ZEIT8233

Assessment Overview

Capstone assignment

Course Learning Outcomes

- CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.
- CLO2 : Calculate the terminal effects of blast and fragmentation warheads.
- CLO3 : Identify the various methods and limitations associated with warhead fuzing systems.
- CLO4 : Evaluate the vulnerabilities of explosive systems throughout the capability lifecycle.
- CLO5 : Describe the trade-offs associated with weapon performance and accuracy including system safety compliance.

Detailed Assessment Description

Major assignment

Assessment Length

No more than 20 pages

Submission notes

Typewriting; Word or PDF

Assignment submission Turnitin type

This is not a Turnitin assignment

Quiz 1

Assessment Overview

Quiz of CLO 1

Course Learning Outcomes

- CLO1 : Analyse the thermochemistry of explosives and the properties of typical explosive compounds.

Detailed Assessment Description

Open book online quiz, one attempt only

Assignment submission Turnitin type

This is not a Turnitin assignment

General Assessment Information

Outcomes-Assessment

There will be three online quizzes that will be set using the UNSW Moodle site. There will also be one major assignment in which students are individually expected to prepare technical essays, calculations, diagram explanations, etc. **No AI tools are allowed**. Once detected, it will be reported, and outcome will follow UNSW's student code of conduct policy and corresponding procures. This is a postgraduate course and students are expected to learn new knowledge through the assignments.

Marking rubric for the major assignment will be provided for assignments before the start date.

Details of the assessments will be given in the lectures.

The first quiz will be due in the end of week 3 (2nd Aug). Feedback, grades, and worked solutions will be given to students during week 4 before the census date (end of week 4).

Late Submission of Assignment

Unless prior arrangement is made with the lecturer or a formal application for special consideration is submitted, a penalty of 5% of the total available mark for the assessment will apply for each day that an assessment item is late up to a maximum of 5 days (120 hours) after which an assessment can no longer be submitted and a grade of 0 will be applied.

Supplementary Assessment

Supplementary assessment may be offered to any student who fails an assessment task if their request for Special Consideration for that task is approved. The mark awarded for the assessment task will be based on the supplementary assessment and previous results.

Where a student fails an assessment task in a course in the final term or semester of their program but does not have an approved Special Consideration for that task, supplementary assessment may still be offered in cases where passing the task would have resulted in the student passing the course and completing the program. This requirement does not apply to research- or project-based assessments and theses.

Where a supplementary assessment is provided to a student with a Fail based on the overall course result, the final mark for the course will be capped at 50%.

For the avoidance of doubt, please refer to the current UNSW Assessment Implementation Procedure.

Grading Basis

Standard

Requirements to pass course

Achieve a composite mark of at least 50 out of 100 to pass this course

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 15 July - 19 July	Lecture	Basic Chemistry and Physics
Week 2 : 22 July - 26 July	Lecture	Detonics and systems engineering concepts
Week 3 : 29 July - 2 August	Lecture	The Explosive Train and Metal-Pushing
	Assessment	Quiz 1 will be released in week 3
Week 4 : 5 August - 9 August	Lecture	Terminal Effects – Blast
Week 5 : 12 August - 16 August	Lecture	Terminal Effects – Fragmentation
Week 6 : 19 August - 23 August	Lecture	Underwater effects and Ammunition Launch Systems
	Assessment	Quiz 2 will be released in week 6
Week 7 : 9 September - 13 September	Lecture	Fuzing
Week 8 : 16 September - 20 September	Lecture	Safe and Arming Devices
Week 9 : 23 September - 27 September	Lecture	Insensitive Munitions
	Assessment	Quiz 3 will be released in week 9
Week 10 : 30 September - 4 October	Lecture	Systems Integration
Week 11 : 7 October - 11 October	Lecture	Handling, Transport and Disposal
	Assessment	Major assignment (40%) will be released in week 11
Week 12 : 14 October - 18 October	Lecture	Case study & Numerical simulations of EO
Week 13 : 21 October - 25 October	Reading	Revision and Assignment Preparation
	Assessment	Major assignment due in this week

Attendance Requirements

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

General Schedule Information

This course will be run as an online delivery module with the academic content delivered in an approximate 12-weeks period, the last three weeks are the supplementary courses for the missed lessons due to holidays, military training days or other.

Lecture recordings will be released on weekly basis.

Since the lecture series will be provided in a distance mode, all the lectures will be recorded and uploaded as video files or links that can be redirected to videos. Students are encouraged to email me to arrange a meeting in Zoom, Teams, or other software which is practical.

The sequence of lecture and the timing of assessment items may change, please follow the lecture and annoucement to check the change.

Course Resources

Prescribed Resources

Akhavan, J: The Chemistry of Explosives1,2, 3rd Ed, (2011), ISBN: 9781849733304
Hazell, PJ: Armour: Materials, Theory, and Design, CRC Press (2023), 2nd ed ISBN: 9780367419714

Recommended Resources

Klapötke, TM: Chemistry of High-Energy Materials2 (2022), ISBN: 9783110739497
Cooper, PW: Explosives Engineering2 (1996), ISBN: 9780471186366
Meyer, R, Köhler, J, Homburg, A: Explosives2, 6th Ed (2007), ISBN: 9783527316564

Additional recommendation reading list will be provided during the teaching sessions.

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

You can email me, program convenor, or other EO lecturers to discuss about anything related to the course/program, such as learning experience, unclear explained concepts, relevance of the course content, iterative coursework developement, etc.

There will be a section on Moodle where you can formally express yourself or other feedback.

There will alse be a discussion section on Moodle where you might discuss what was identified in past feedback and how this course was changed to address the issue.

Please feel free to contact us.

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	Zongjun Li		UNSW Canberra @ ADFA, Building 20, Room 101	0450839688	From Monday to Friday (0900 to 2100)	No	Yes
Lecturer	Jianshen Wang		UNSW Canberra @ ADFA, Building 26, Room G34	0415860818	From Monday to Friday (0900 to 1700)	No	No