UNSW Course Outline

ZEIT8229 Non-Communications Electronic Warfare - 2024

Published on the 11 Feb 2024

General Course Information

Course Code : ZEIT8229
Year : 2024
Term : Semester 1
Teaching Period : Z1
Is a multi-term course? : No
Faculty : UNSW Canberra
Academic Unit : School of Systems and Computing
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

This course introduces the field of non-communications electronic warfare including Radar Electronic Support and Jamming, Infrared Countermeasures, and Missile and Laser Warning. It addresses the fundamentals of each area, and provides an understanding of the support,

platform and operational issues affecting Electronic Warfare systems. Students should have, or be willing to gain an appreciation of radar.

Course Aims

The aim of the course is to introduce the student to the field of noncommunications electronic warfare including Radar Electronic Support and Jamming, Infrared Countermeasures, and Missile and Laser Warning. It addresses the fundamentals of each area, and provides an understanding of the support, platform and operational issues affecting Electronic Warfare systems. Students should have, or be willing to gain an appreciation of radar.

Relationship to Other Courses

The course is a stand-alone course and does not have any prerequisite courses for enrolment.

Course Learning Outcomes

Course Learning Outcomes	International Council on Systems Engineering (INCOSE)
CLO1 : Summarise the electronic warfare taxonomy	• KNOW2.5 : Know the importance of the design definition process and its relationship to implementation
CLO2 : Explain the key features of selected non-communication electronic warfare equipment and apply this knowledge to frame analysis of EW scenarios.	• KNOW2.3 : Know the concepts of requirements definition
CLO3 : Calculate basic performance of selected noncommunication electronic warfare systems	• KNOW2.5 : Know the importance of the design definition process and its relationship to implementation
CLO4 : Appraise the performance of platform protection systems.	• KNOW2.5 : Know the importance of the design definition process and its relationship to implementation

Course Learning Outcomes	Assessment Item
CLO1 : Summarise the electronic warfare taxonomy	
CLO2 : Explain the key features of selected non-communication electronic warfare equipment and apply this knowledge to frame analysis of EW scenarios.	
CLO3 : Calculate basic performance of selected noncommunication electronic warfare systems	
CLO4 : Appraise the performance of platform protection systems.	

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

The learning strategy used in this course is to use readings to introduce key concepts, and then a series of exercises to reinforce these readings and develop a deeper, applied understanding. You should do the exercises immediately after reading each section of the course, and treat the online
tests as further revision and a chance to get feedback on extensions of the core readings.
The assignment can be tailored to your unique skills and interests and develop in-depth competence, a systems approach and/or communication skills.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Class Test	50%	Start Date: 27/05/2024 12:00 AM Due Date: 27/05/2024 12:00 AM
Assignment	30%	Start Date: Not Applicable Due Date: 21/06/2024 11:59 PM
Online Test	20%	Start Date: Not Applicable Due Date: 24/05/2024 11:59 PM

Assessment Details

Class Test

Detailed Assessment Description

The class test will be conducted in the week commencing Mon 27 May 24. The class test is of two hours duration, and is closed book (though a formula sheet will be provided and calculators either without stored memory or with memory erased for the conduct of the test are permitted).

The class test will cover content delivered during Weeks 1 to 13 of the course.

The class test will be delivered onsite at the main UNSW Canberra campus. Remote invigilation arrangements are available for students that are unable to take the class test onsite.

Assessment Length

2 hours

Assignment submission Turnitin type

This is not a Turnitin assignment

Assignment

Detailed Assessment Description

The assignment is comprised of a 5000 word paper on a topic of relevance to the course.

The assignment is to be submitted online by Fri 21 Jun 24.

Further detail regarding the assignment and its marking rubric are available via the course Moodle site.

Assessment Length

5000 words

Assignment submission Turnitin type

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

Online Test

Detailed Assessment Description

This assessment is comprised of two discrete online tests, each of which individually comprise 10% of the total course mark.

Online Test 1 covers content delivered in Weeks 1 - 4 of the course. Online Test 1 may be completed at any date up to 24 May 24, but if completed prior to 23 Mar 24 will permit feedfack prior to census date (24 Mar 24).

Online Test 2 covers content delivered in Weeks 5 - 13 of the course. Online Test 2 may be completed at any date up to 24 May 24.

Assessment Length

Both Online Tests are of 2 hours duration

Submission notes

The online tests are conducted via the Moodle teaching platform.

Assignment submission Turnitin type

This is not a Turnitin assignment

General Assessment Information

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.

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.

Grading Basis

Standard

Requirements to pass course

To pass the course you must score a total mark of 50% for the course as a whole. You are NOT required to score more than 50% for all assessment items.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 26 February - 1 March	Online Activity	Overview, RADAR readings (if required)
Week 2 : 4 March - 8 March	Online Activity	ES Receivers
Week 3 : 11 March - 15 March	Online Activity	ES Direction Finding
Week 4 : 18 March - 22 March	Online Activity	ES Power Budgets and Novel Technologies Complete Online Test 1 by 1500 23 Mar 24 to get feedback prior to no fee withdrawal date. No penalty for late submission up to 1500 24 May 24
Week 5 : 25 March - 29 March	Online Activity	Chaff
Week 6 : 1 April - 5 April	Online Activity	Range and Doppler EA
Week 7 : 22 April - 26 April	Online Activity	Angle EA
Week 8 : 29 April - 3 May	Online Activity	Anti-Radiation Missiles and Low Observability
Week 9 : 6 May - 10 May	Online Activity	Infrared Missiles, Flares, and Infrared Jamming
Week 10 : 13 May - 17 May	Online Activity	Missile and Laser Warning
Week 11 : 20 May - 24 May	Online Activity	Directed Energy
Week 12 : 27 May - 31 May	Online Activity	Platform Integration and Support Issues
Week 13 : 3 June - 7 June	Online Activity	Cognitive Non-Comms Electronic Warfare

Attendance Requirements

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

General Schedule Information

See the course Moodle page for the student work guide, which is organised by suggested week. You are free to run ahead or behind the suggested schedule, however the proposed timeline represents a fairly uniform application of effort through the session.

Course Resources

Prescribed Resources

Compulsory Texts

Electronic Warfare in the Information Age; D. Curtis Schleher, Arech House, 1999.

All other course content is contained on the course Moodle page.

Useful References

EW101, Adamy; Artech House; 2001. Also other editions in this series
ELINT: The Interception and Analysis of Radar Signals; Wiley; Artech House; 2006

Recommended Resources

The Association of Old Crows (the global electronic warfare, cyber operations, and information warfare professional body) website - including it's journal ('The Journal of Electromagnetic Dominance') has a wide variety of resources relevant to this course (www.crows.org).

Additional Costs

There are no additional costs associated with this course.

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/stu dentcodepolicy.pdf

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Jeffrey M alone		I don't maintain an office on campus.	0407581131	Contact via email is best, although you are welcome to phone or text (I sometimes work in a secure location so I might not answer straight away, so please leave voice messages). If you wish to meet in person (I largely work at either Fairbairn or Russell)	No	Yes

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.

School-specific Information

The Leaning 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 10,
• Mac OSX Sierra,
• iPad IOS10

Further details:
Moodle System Requirements
Moodle Log In

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

Study at UNSW Canberra

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.

UNSW Canberra Student Hub

For News and Notices, Student Services and Support, Campus Comminity, Quick Links, Important Dates and Upcoming Events

School Contact Information

Deputy Head of School (Education): Dr Erandi Hene Kankanamge

E: e.henekankanamge@adfa.edu.au

T: 02 5114 5157

Syscom Admin Support: syscom@unsw.edu.au

T: 02 5114 5284

Syscom Admin Office: Building 15, Level 1, Room 101 (open 10am to 3pm, Mon to Fri)