



# Course Outline

Term 2 2020

**ENGG9744**

## **Nuclear Safety, Security and Safeguards**

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accident case study. All of these skills will be applicable in a wide range of contexts.

### **Student learning outcomes**

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

After successfully completing this course, you should be able to:

<b>Learning Outcome</b>	<b>EA Stage 1 Competencies</b>
1. Present, critique and defend a safety case for a nuclear (or other safety-critical) activity.	PE1.2, PE1.6, PE2.1, PE2.3, PE2.4, PE3.1, PE3.2, PE3.4, PE3.5



reactor. He is also responsible for QA and configuration management, training, IT support and environmental management. He is Chair of the Reactor Assessment Committee (the equivalent of the internal reactor safety committee) and sits on the ANSTO Safety Assurance Committee (SAC) that oversees all safety across the whole of ANSTO. Mr Summerfield has a BSc (Hons) degree in Nuclear Engineering from the University of Manchester. After near 19 years in the UK and European nuclear power industry, principally as a Systems Safety Engineer, he immigrated to Australia in 1998 to join ANSTO to work on the OPAL reactor project. Here he has played a major role in design and implementation and now management of all regulatory aspects of its highly successful and world-renowned operational performance.

## 5.

<b>WEEK</b>	<b>Material delivered</b>	<b>Relevant Assignment &amp; hand in date(s)</b>
Week 1	Nuclear Safeguards	Safeguards revision questions (Exam assessed)
Week 2	Materials Accounting	
Week 3	Radiation Safety	Emergency scenario (15%) 19th - 29th June staged responses
Week 4	Incident management	
Week 5	Nuclear Security	Threat assessment (15%) Report on 8 <sup>th</sup> July
Week 6	Nuclear safety fundamentals	Safety Case (30%) Check-in 28 <sup>th</sup> July Report on 3 <sup>rd</sup> August Presentations on 5 <sup>th</sup> August
Week 7	The safety case	
Week 8	Safety Assessment	
Week 9	Safety Analysis	
Week 10	Safety Case Presentations	

# 6. Assessment

## Assessment overview

Assessment	Group Project? (# Students per group)	Length	Weight	Learning outcomes assessed	Assessment criteria	Due date and submission requirements	Deadline for absolute fail	Marks returned
Emergency Scenario	No	Max. 500 words, 5 min video	15%	3, 6 and 7	Knowledge of radiation protection; appropriate responses; effective communication	Staged submissions 19-29 <sup>th</sup> June	23:59 1 <sup>st</sup> July	Friday 3 <sup>rd</sup> July
Design Basis Threat Assessment	Yes (3?)	n/a (spreadsheet workbook)	15%	2, 4	Threat assessment; screening the threats; translating and modifying threats; document presentation.	8 <sup>th</sup> July	23:59 10 <sup>th</sup> July	Friday 10 <sup>th</sup> July
Safety Case	No	Max 20 pages	30%	1, 4, 6 and 7	Safety case structure and argument, safety assessment, safety analysis, peer review and presentation	Check-in 28 <sup>th</sup> July Report on 3 <sup>rd</sup> Aug. Presentations on 5 <sup>th</sup> August	18:00 5 <sup>th</sup> August	12 <sup>th</sup> August
Final exam	No	2 hours	40%	4, 5, 6, and 7	All course content from weeks 1-10 inclusive.	Exam period, date TBC	N/A	Upon release of final results



## Assignments

The assignments allow self-directed study leading to the solution of partly structured problems, reports and presentations. Marks will be assigned according to how completely and correctly the assignments have been addressed, and the understanding of the course material demonstrated by the report. All the assignments contribute to a structured, cumulative coursework project that enables students to demonstrate their learning and integrates the many aspects of the very diverse course material.

The three most advanced learning outcomes (1-3) each correspond to an online, multimedia assignment. The safety case assignment is marked both by student peers and by the course directors. The reason for this peer review is to teach the essential function of a safety/security case for licensing - which is for it to be openly critiqued. Therefore advocating for one's own assessments, as well as giving and receiving objective criticism, are essential skills for all levels of professionalism in safety-critical industries.

## Marking

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

## Examinations

You must be available for all quizzes, tests and examinations.

Final examinations for each course are held during the University examination periods: February for Summer Term, May for T1, August for T2, and November/December for T3.

Please visit myUNSW for Provisional Examination timetable publish dates.

For further information on exams, please see the [Exams](#) webpage.

## Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to submitting an assessment or sitting an exam.

**Please note** that UNSW now has a [Fit to Sit / Submit rule](#), which means that if you attempt an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the [Special Consideration page](#).

## 7. Expected ~~resources for students~~

1. Nuclear Safeguards, Security and Nonproliferation: Achieving Security with Technology and Policy  
Author: James Doyle  
ISBN

ISBN 978-0679408192  
Publisher Random House

If plagiarism is found in your work when you are in first year, your lecturer will offer you assistance to improve your academic skills. They may ask you to look at some online resources, attend the Learning Centre, or sometimes resubmit your work with the problem fixed. However more serious instances in first year, such as steal or paying someone to do your work, may be investigated under the Student Misconduct Procedures.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis) even suspension from the university. The Student Misconduct Procedures are available here:

[www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf](http://www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf)

## 10. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and policies. In particular, students should be familiar with the following:

- [Attendance](#)
- [UNSW Email Address](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)
- [Academic Honesty and Plagiarism](#)
- [Equitable Learning Services](#)



# Applied Nuclear Engineering (INMA) Learning Outcomes for Masters' Level Course in Nuclear

<b>INMA Competency Area*</b>	<b>INMA Competency Level</b>
1.2 International nuclear organizations	1
1.3 National nuclear technology policy, planning and politics	1
1.4 Nuclear standards	1
1.5 Nuclear law	1
1.8 Nuclear licensing, licensing basis and regulatory processes	2
1.9 Nuclear security	2
1.10 Nuclear safeguards	2
1.11 Transport of nuclear goods and materials	1
2.1 Nuclear power plant and other facility design principles	1
2.2 Nuclear power plant/facility operational systems	1
2.6 Nuclear safety principles and analysis	3
2.7 Radiological safety and protection	3
3.13 Nuclear incident management, emergency planning and response	1
4.3 Communication strategies for leaders in nuclear	1