Course Outline

Term 2 2020

ENGG9743

Fuel Cycle, Waste and Life Cycle Management

1. Staff contact details

Contact details and consultation times for course convenor

Name: Dr. Patrick Burr
Office location: Room 402A, Ainsworth building (J17)
Email: p.burr@unsw.edu.au

The preferred point of contact is via Teams rather than via email, and whenever possible through the open class discussion forum ï however private contact is also encouraged for sensitive matters. All email enquiries should be made from your student email address with ENGG9743 in the subject line; otherwise they may not be answered. Email queries may be answered in the learning platform to benefit all students.

Please see the course Moodle.

2. Important links

- Moodle
- Lab Access
- Health and Safety
- Computing Facilities
- Student Resources
- Course Outlines
- Engineering Student Support Services Centre
- Makerspace
- UNSW Timetable
- UNSW Handbook
- UNSW Mechanical and Manufacturing Engineering

3.

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:

Learning Outcome		**EA Stage 1 Competencies**
1.	Describe the fundamentals of uranium mining, milling and conversions	PE1.3
2.	Discuss fuel fabrication techniques and reprocessing routes	PE1.2, PE1.3
3.	Calculate key parameters for enrichment, fabrication and reprocessing	PE1.3, PE2.1
4.	Illustrate systems and processes required in nuclear engineering facilities beyond conventional engineering practice.	PE1.5, PE2.4
5.	Compare and contrast different reactor systems and different medical isotope production methods.	PE1.4
6.	Describe technological challenges and regulatory aspects associated with decommissioning, environmental protection, monitoring and remediation.	PE1.5
7.	Identify options for processing high level waste for storage and disposal.	PE1.3, PE1.5
8.	Examine the key principles associated site selection, site characterization, waste acceptance criteria for near-surface and deep disposal of radioactive waste.	PE1.5, PE2.3

This course also addresses the IAEA International Nuclear Management Academy (INMA) learning outcomes for mastersôlevel course in Nuclear Technology Management (see Appendix B).

4. Teaching strategies

Delivery Mode

Fully online. The teaching in this course aims at establishing a good fundamental understanding of the areas covered using video recordings, reading materials, self-moderated (tutor guided) forum discussions, and online (synchronous) tutorials.

Learning in this course

You are expected to complete all online tasks, including watching videos, answering quizzes, attending tutorials, and engaging in forum discussions to maximise learning. In addition to the lecture notes/video, you should read relevant sections of the recommended text. Reading additional texts will further enhance your learning experience. Group learning

is also encouraged. UNSW assumes that self-directed study of this kind is undertaken in addition to attending face-to-face classes throughout the course. Learning materials and graded assessments will be paced throughout the duration of the course. As some of the assignments required group interaction, it is essential that you keep up with the pace of the course, and effectively manage your time in this course to view the material and complete the assignments on time.

Tutorial classes

You should attempt all of your problem sheet questions in advance of attending the synchronous tutorial sessions. The importance of adequate preparation prior to each tutorial cannot be overemphasized, as the effectiveness and usefulness of the tutorial depends to a large extent on this preparation. Group learning is encouraged. Answers for these questions will be discussed during the tutorial class and the tutor will cover the more complex questions in the tutorial class. In addition, during the tutorial class, 1-2 new questions that are not in your notes may be provided by the tutor, for you to try in class. These questions and solutions may not be made available on the web, so it is worthwhile for you to attend your tutorial classes to gain maximum benefit from this course.

5.

Week	Topic	Delivery Mode	Suggested Readings

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
Take-home test (2)	No	2 hours	60%	1, 2, 3, 5	Lecture material from weeks 1-3 (test 1) and weeks 4-7 (test 2)	Friday 5pm weeks 4 and 8	Wednesday weeks 5 and 9	One weeks after submission
Quiz	No	1 hour	15%	6, 7, 8	Lecture material from weeks 8-10 inclusive.	Friday 5pm week 10	N/A	Monday week 11
Final assignment	No	N/A	25%	2, 4, 5, 7	Completeness and correctness of response to problem, quality of report, understanding of course material from weeks 1-10.	Exam period, date TBC	N/A	Upon release of final results

8. [illegible]

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the Schoolôs Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

In this course, recent improvements resulting from student feedback include: providing a schedule for the tutorial times for the entire term; removing online video submissions to avoid potential IT complications; more time has been allocated for tutorials and practice questions; diversity of guest lecturers from industry was retained; the self-moderated forum was a highly-appreciated feature of last yearôs delivery, thus it will be retained but with the following changes informed by student feedback: the discussion will be condensed into fewer days of the week and all marks associated with formative component have been removed in view of the small number of students this term.

9. Academic honesty and plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism.

(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

10. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. 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

Appendix B: IAEA International Nuclear Management Academy (INMA) Learning [illegible] Masters' Level Course in Nuclear

INMA Competency Area*	INMA Competency Level
2.1 Nuclear power plant and other facility design principles	1
2.2 Nuclear power plant/facility operational systems	1
2.3 Nuclear power plant/facility life management	1
2.5 Systems engineering within nuclear facilities	1
2.9 Nuclear fuel cycle technologies	2
2.10 Nuclear waste management and disposal	2
2.11 Nuclear power plant/facility decommissioning	1
2.12 Nuclear environmental protection, monitoring and remediation	1
2.13 Nuclear R&D and innovation management	1
2.14 Application of nuclear science	2
3.1 Nuclear engineering project management	1

*Grosbois, J. de, F. Adachi, and H. Hirose. 2017. ñInternational Nuclear Management Academy Masterôs Programmes in Nuclear Technology Management.òIAEA.