



Jordan University of Science and Technology
Faculty of Engineering
Nuclear Engineering Department

NE460 Fuel Cycle & Waste Management

Second Semester 2018-2019

Course Catalog

3 Credit Hours. Front end and back end nuclear fuel cycle including mining, milling, conversion and enrichment, fuel design and fabrication and waste fuel management and nuclear reactor decommissioning.

Text Book

Title	The Nuclear Fuel Cycle; Analysis and Management
Author(s)	Robert G. Cochran, Nicholas Tsoulfanidis, American Nuclear Society, 1999.
Edition	2nd Edition
Short Name	Ref#1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	The Nuclear Fuel Cycle: from Ore to Wastes	Wilson, P. D., Oxford University Press, 1996	2nd Edition	

Instructor

Name	Dr. Abdullah Alali
Office Location	-
Office Hours	Sun : 08:30 - 09:30 Tue : 08:30 - 09:30 Tue : 12:30 - 13:30 Wed : 08:00 - 09:00 Thu : 08:30 - 09:30 Thu : 12:30 - 13:30
Email	aealali@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue, Thu : 11:30 - 12:30 Room: E2113

Prerequisites		
Line Number	Course Name	Prerequisite Type
2004410	NE441 Nuclear Reactors Analysis	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction and review of the nuclear fuel cycle.	From Ref#1
Weeks 2, 3	Nuclear fuel resources, mining and milling.	From Ref#1
Weeks 4, 5	Conversion and enrichment.	From Ref#1
Weeks 6, 7, 8	Reactor fuel design and fabrication.	From Ref#1
Weeks 9, 10	Reprocessing and recycling.	From Ref#1
Weeks 11, 12, 13	High level waste management.	From Ref#1
Weeks 14, 15	Low level waste management and decommissioning of nuclear power plant.	From Ref#1

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Identify the common processes of the nuclear fuel cycle. [11, 17]	10%	First Exam, Final exam
Describe uranium mining methods. [11, 17]	8%	First Exam, Final exam
Describe basic milling process steps. [11, 17]	8%	First Exam, Final exam
Distinguish between different enrichment processes. [21, 14, 17]	16%	First Exam, Final exam
Describe fuel fabrication steps. [11]	6%	Second Exam, Final exam
Identify the properties of spent nuclear fuel. [11, 14]	8%	Second Exam, Final exam
Describe the reprocessing and recycling of spent nuclear fuel. [11]	8%	Second Exam, Final exam
Characterize the HLW and LLWs. [11, 14]	8%	Second Exam, Final exam

Discuss the wet and dry storage of the spent nuclear fuel. [11, 14]	12%	Second Exam, Final exam
Discuss the final disposal methods. [11, 14]	16%	quize, Final exam

Relationship to Program Student Outcomes (Out of 100%)						
1	2	3	4	5	6	7
57			26			17

Evaluation	
Assessment Tool	Weight
First Exam	27%
Second Exam	27%
quize	6%
Final exam	40%

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