



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

NE460 Fuel Cycle & Waste Management

Second Semester 2020-2021

**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**

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

**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	
Email	aealali@just.edu.jo

**Class Schedule & Room**

Section 1:

Lecture Time: Mon, Wed : 13:00 - 14:30

Room: 150 منصة الكترونية

**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%	
Describe uranium mining methods. [11, 17]	8%	
Describe basic milling process steps. [11, 17]	8%	
Distinguish between different enrichment processes. [21, 14, 17]	16%	
Describe fuel fabrication steps. [11]	6%	
Identify the properties of spent nuclear fuel. [11, 14]	8%	
Describe the reprocessing and recycling of spent nuclear fuel. [11]	8%	
Characterize the HLW and LLWs. [11, 14]	8%	
Discuss the wet and dry storage of the spent nuclear fuel. [11, 14]	12%	
Discuss the final disposal methods. [11, 14]	16%	

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

Evaluation	
Assessment Tool	Weight
Midterm Exam	25%
quize	25%
Final exam	50%

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