



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

NE526 Nuclear Security And Safeguards - JNQF Level: 7

Second Semester 2023-2024

**Course Catalog**

3 Credit Hours. This course focuses on the key elements of nuclear security and safeguards. It examines methods for planning and evaluating nuclear security activities at the State and facility level, establishing nuclear security culture in different types of nuclear and radiological installations, and examines information security measures. Topics include an overview of the subject area, legal framework, principles of safeguards, nuclear materials accountancy, information security, interrelationships between safety, security and safeguards, security culture, and applications of nuclear security.

**Teaching Method:** Blended

**Text Book**

<b>Title</b>	Introduction to Nuclear Security
<b>Author(s)</b>	International Atomic Energy Agency (IAEA)
<b>Edition</b>	1st Edition
<b>Short Name</b>	Ref#1
<b>Other Information</b>	

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref#2	Lecture Notes	Prof. Salaheddin Malkawi	6th Edition	

**Instructor**

Name	Prof. Salaheddin Malkawi
Office Location	E2L2
Office Hours	
Email	salahm@just.edu.jo

**Class Schedule & Room**

Section 3:  
 Lecture Time: Sun, Tue : 09:30 - 10:30  
 Room: E2113

**Prerequisites**

Line Number	Course Name	Prerequisite Type
2004650	NE465 Nuclear Reactor Materials	Prerequisite / Study

**Tentative List of Topics Covered**

Weeks	Topic	References
Weeks 1, 2	Introduction to Nuclear Security	Ch1 From Ref#1
Weeks 3, 4	Chemical, Biological, Radiological and Nuclear (CBRN) Weapons	Ch2 From Ref#2
Week 5	Nuclear Security Threats	Ch2 From Ref#1
Week 6	Overview of the Legal Framework for Nuclear Security	Ch3 From Ref#1
Week 7	Planning Nuclear Security at the State Level	Ch4 From Ref#1
Week 8	Planning Nuclear Security of Nuclear/Radiological Facility	Ch5, 6 From Ref#1
Week 9	Introduction to detection of, and response to, criminal or unauthorized acts involving nuclear and other radioactive material out of regulatory control	Ch7 From Ref#1
Week 10	Information Security	Ch8 From Ref#1
Week 11	Security culture: Concept and Model	Ch9 From Ref#1
Weeks 12, 13, 14	Non-Proliferation, International Safeguards, and the Role of the IAEA	Ch9 From Ref#2
Week 15	Interrelationships between safety, security and safeguards	Ch10 From Ref#2

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Analyze motivations and capabilities of adversaries and be able to characterize a Design Bases Threat (DBT) for a nuclear/radiological facility [5SO1] [1L7K1]	20%	

Describe and explain the operation of detection, delay and response in a nuclear security system. [35SO2] [1L7S2]	20%	
Explain the roles and responsibilities of the state and facility in nuclear security. [15SO3] [1L7C3]	20%	
Give a brief description of nuclear weapons and other weapons of mass destruction. [20SO4] [1L7C2]	20%	
Describe the nonproliferation treaty, arms control and the international system of safeguards [35SO6] [1L7S3]	20%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
20	20	20	20		20	

Relationship to NQF Outcomes (Out of 100%)				
L7K1	L7S2	L7S3	L7C2	L7C3
20	20	20	20	20

Evaluation	
Assessment Tool	Weight
First Exam	20%
Projects	10%
Quizzes	5%
Second Exam	25%
Final Exam	40%

Policy	
Attendance Policy	Students are expected to attend all classes, as per university regulations. Attendance will be checked at the beginning of each class.
Additional Information	This course syllabus provides a general plan for the course; deviations may be necessary.

Date Printed: 2024-03-16