

# University of New Mexico Nuclear Security Program Nuclear Security Summer School



## STARTING SUMMER 2022

The University of New Mexico Nuclear Engineering department has partnered with the U.S. Department of Energy National Nuclear Security Administration Office of International Nuclear Security (NNSA-INS) and experts from Sandia, Los Alamos, and Idaho national laboratories to offer a two-week, executive-style Nuclear Security Summer School course focusing on the theory, current practices, advancements in, and design and analysis of nuclear security systems. The course will include both class-based discussion and hands-on experience, with students visiting the renown Nuclear Security Technology Complex at Sandia National Laboratories in Albuquerque.

### COURSE PURPOSE

This course provides accredited professional development in nuclear security for domestic and international participants by sharing foundational knowledge in the history and theory of nuclear security, hands-on demonstrations and performance testing of nuclear security technologies, and nuclear system design and analysis. Upon completion, students will receive UNM-based continuing education units (CEUs) and certificate of completion from the U.S. Department of Energy National Nuclear Security Administration Office of International Nuclear Security.

### COURSE OUTLINE

This professional development course consists of two, one-week modules. This compressed format was designed to meet the needs of working professionals and students alike. The two modules are:

- Introduction to the Fundamentals of Nuclear Security
- Nuclear Security System Design and Analysis

### COURSE DETAILS

**Level:** Professional  
**Credits:** 4 CEUs  
**Start:** July 5-15, 2022  
**Times:** 08:00–12:15 (MDT)  
**Location:** Online hybrid  
**Cost:** \$1200

#### To register:

- Log on to the UNM Continuing Education website at <http://ce.unm.edu/>
- Search for Nuclear Security Summer School (course ID 20241)
- Review the course description and select Add to Cart
- Pay for the course with a credit card by selecting Checkout; to use a purchase order, call (505) 277-0077

#### Who should take this course:

- Nuclear engineers
- Advanced nuclear engineering students and doctoral candidates
- DOE personnel
- Nuclear security managers and professionals
- University faculty



**Sandia National Laboratories**



Contact Us  
Contact [INSinfo@nnsa.doe.gov](mailto:INSinfo@nnsa.doe.gov)



## MODULE 1: INTRODUCTION TO THE FUNDAMENTALS OF NUCLEAR SECURITY

This module is a condensed version of the “Nuclear Security Technology & Practices” course used as the introductory portion of the UNM Nuclear Security Program. The objective of this module focuses on presentations related to the logical foundations and analytical fundamentals of nuclear security. Potential topics include:

- Core concepts for nuclear security
- Tour of Nuclear Security Technology Complex at Sandia National Laboratories
- Policies and best practices in nuclear security
- Current context and capabilities
- Challenges to current nuclear security approaches
- Future capabilities, challenges, and needs

### Proposed Module 1 Agenda

DATE	TIME	LECTURE
Jul 5	08:00-08:30	Course overview and introductions
	08:30-09:00	History of Nuclear Security: Gates, Guards, & Guns
	09:00-09:15	Break
	09:15-10:15	Introduction to Nuclear Security: From Theory to Practice
	10:15-11:15	Threats to Nuclear Security: Identification, Assessment, Mitigation Loop
	11:15-12:00	Compare and contrast nuclear security, nuclear safeguards, & nuclear safety
	12:00-12:15	Day 1 review
Jul 6	08:00-09:00	Badging for Sandia National Laboratories tour
	09:00-09:30	Travel to Nuclear Security Technology Complex (NSTC)
	09:30-10:00	Perimeter Intrusion Detection and Assessment System (PIDAS) tour
	10:00-10:30	Material Receiving Area (MRA) and Central Alarm Station (CAS) tour
	10:30-11:00	Advanced technology discussion
	11:00-11:30	Unmanned Aircraft System (UAS/drone) Integration to Physical Security Systems
Jul 7	11:30-12:00	Depart NSTC
	08:00-09:00	Physical Protection System (PPS) Design: A DEPO-Based Perspective
	09:00-10:00	Nuclear Security System Evaluation
	10:00-10:15	Break
	10:15-11:00	Vulnerability Assessment
	11:00-12:00	Advanced Vulnerability Assessment
Jul 8	12:00-12:15	Day 3 review
	08:00-09:00	Nuclear Material Accounting & Control (NMAC)
	09:00-10:00	Role(s) of Humans in Nuclear Security
	10:00-10:15	Break
	10:15-11:15	UAS and Countering UAS Threats
	11:15-12:00	Securing Nuclear Facilities Against Cyber Threats
	12:00-12:15	Day 4 review



## MODULE 2: NUCLEAR SECURITY SYSTEM DESIGN AND ANALYSIS

Students will design a security system for a hypothetical facility to protect against a hypothetical design basis threat. Students will be able to select a hypothetical facility that most aligns with their interests, such as a small modular reactor, light water reactor, research reactor, multiple facility complex, fuel fabrication facility, reprocessing facility, or fuel fabrication plant. Students will work in groups and be guided by a mentor from one of the primary stakeholders. *NOTE: Completion of the first module within the prior three years is a prerequisite for this module.*

### Proposed Module 2 Agenda

DATE	TIME	LECTURE
Jul 11	08:00-09:00	Course overview and introductions
	09:00-10:00	System effectiveness overview
	10:00-10:15	Break
	10:15-11:15	DEPO review
	11:15-11:30	Day 1 review
Jul 12	08:00-09:00	Define Physical Protection Systems (PPS)
	09:00-10:00	Design Basis Threat
	10:00-10:15	Break
	10:15-11:15	Target identification
	11:15-12:00	Security system design
Jul 13	12:00-12:15	Day 2 review
	08:00-08:30	Intrusion detection
	08:30-09:30	Access control
	09:30-10:15	Delay
	10:15-10:30	Break
	10:30-11:15	Response
Jul 14	11:15-12:00	Nuclear Material Accounting & Control (Methodologies)
	12:00-12:15	Day 3 review
	08:00-08:30	System analysis
	08:30-09:30	Performance testing
	09:30-10:15	Path analysis
	10:15-10:30	Break
	10:30-11:15	Tabletop exercises and Modeling & Simulation
Jul 15	11:15-12:00	Force-on-force exercises
	12:00-12:15	Day 4 review
	08:00-08:30	Define, design, analyze review
	08:30-09:45	Cybersecurity design
	09:45-10:15	UAS vehicles
	10:15-10:30	Break
	10:30-11:15	Insider threats
	11:15-12:00	Course review



#### CONTACT INFORMATION:

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