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United States
Department of Energy
National Nuclear Security Administration

International Nuclear Security – Graduate Nuclear Security Program

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Reducing Risk of Nuclear Terrorism

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Reducing Risk of Nuclear Terrorism

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Outline

- Introduction
- Program Framework
- Education
- Research
- Professional Development
- Future Efforts

Introduction

- Graduate Nuclear Security Program at the University of New Mexico (UNM)
  - Domestic and international applications
  - Technically trained
  - Cross disciplines (engineering, physics, math, computer science, etc.)

- Graduate Nuclear Security Research
  - STEM-based research
  - Social-science based research
  - Impact improvements in domestic and international nuclear security

- Professional Development and Fellowship Program
  - Pipeline to careers in nuclear security
  - Formalized professional development to train Subject Matter Experts (SMEs)
  - Link students to careers in nuclear security

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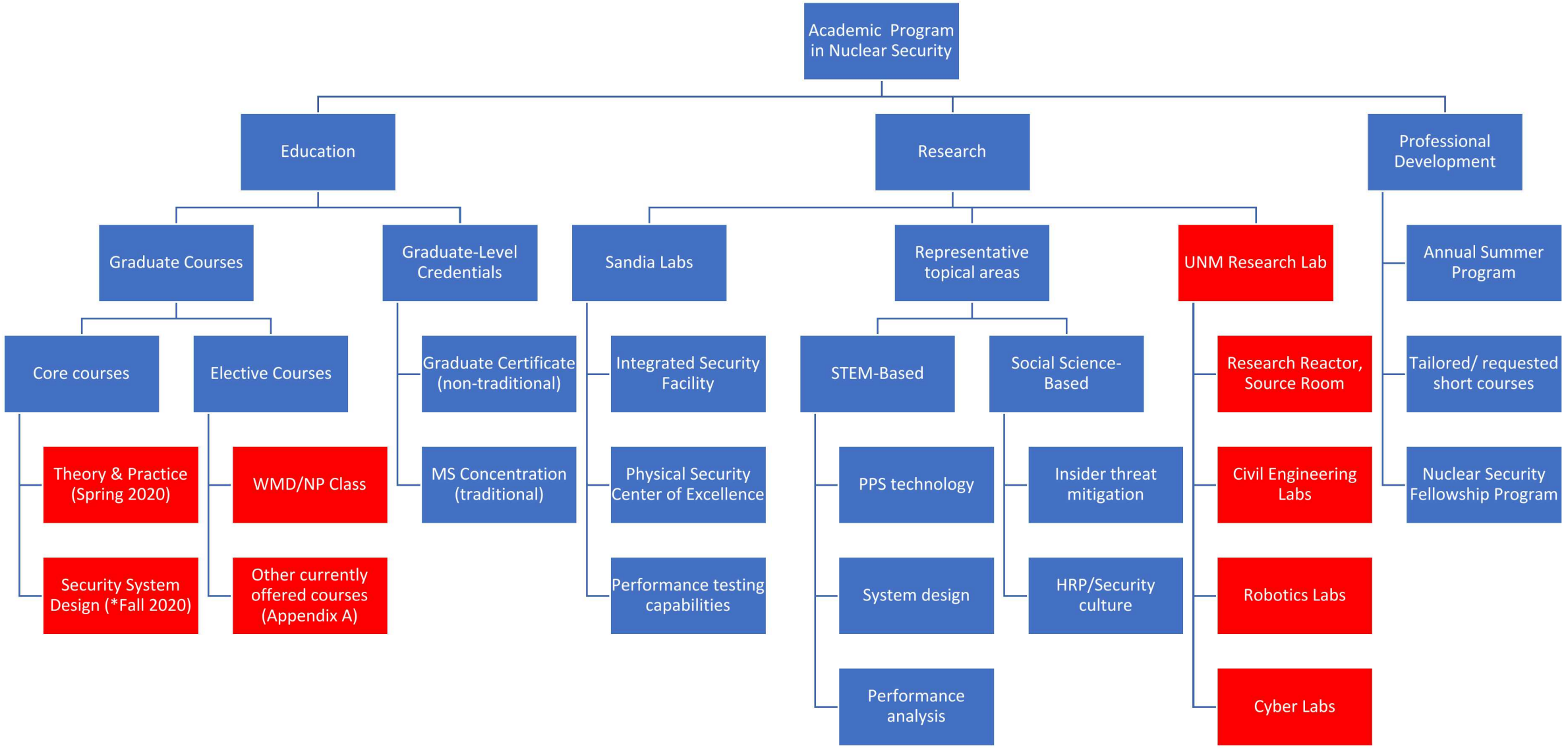
Program Framework



Graduate Education

- The program is based on a holistic approach to nuclear security
  - Core courses as the ***foundational knowledge*** of nuclear security
  - Elective courses to address ***broad range*** of related topics

- Current effort: UNM.NE.515-***Nuclear Security: Theory & Practice*** (Spring 2020)
  - First core course → "is an attempt to go a mile wide and a mile deep"
  - 18 students → Sandia interns, Sandia managers, Palo Verde Employee, Jordanian IAEA nonproliferation team member

- Future effort: UNM.NE.515-***Advanced Nuclear Security System Design and Analysis*** (*Fall 2020)
  - Aimed at the design and evaluation process of a physical security system

Graduate Research

- **Goal:** advance fundamental nuclear security research
  - Provide a research platform into new nuclear security technologies & design/analysis methods
  - Address fundamental issues typically outside Sandia' purview/customer comfort

- **How?**
  - 13th ranked nuclear engineering program in the US with a well-established research program
  - UNM research reactor (potential security system lab)
  - Radiation detection laboratory (potential PPS component lab)
  - Integrated Security Facility (ISF) at Sandia National Laboratories (Sandia)
  - Collaboration between Sandia, Los Alamos National Laboratory and UNM

- Existing research funding sources to increase student research and development

Nuclear Security Program Professional Development

- **Goal:** provide more options for accreditation in nuclear security
  - Another mechanism to support domestic and international professional development
  - Similar to other CEUs for professional engineers

- Current effort: Advanced Nuclear Security Summer School (*Summer 2021)
  - Three-week, modular, in-residence program at UNM
  - Leverages course material from Education pillar + practical experience at national labs

- Future efforts:
  - Develop process for creating specific courses/events tailored to stakeholder needs
  - Collaborating with ongoing Sandia trainings to offer accreditation

Nuclear Security Fellowship Program

- **Goal:** provide a process to prepare next generation nuclear security experts
  - Designed to parallel NNSA's current Nonproliferation Graduate Fellowship Program
  - Target **technical** students completing their undergraduate degree

- Key Fellowship Program Elements
  - Apply in the winter of the senior (undergraduate) year
  - Program interweaves with a traditional two-year masters program
  - Selected by a pool of nuclear security stakeholders (GMS, INS, ORS, NSDD, DOS, DTRA, national laboratories, etc.)
  - Future plans to engage external stakeholders for physical security expertise including DHS, FBI, and Secret Service

Future Efforts

- **Education:**
  - Launch *Advanced Nuclear Security System Design and Analysis* course
  - Develop elective courses that provide increased understanding of nuclear security (new or existing)
- **Research:**
  - Launch STEM-based research projects at UNM
  - Launch social-science based research projects at UNM
- **Professional Development:**
  - Run Advanced Nuclear Security Summer School
  - Codify professional development and onboarding program
- **Programmatic**
  - Establish Memorandum of Understanding between UNM and Sandia
  - Nuclear security faculty to be housed at the university

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Questions?