

## Establishment of a Master's Degree Program for Nuclear Security at the Penn State University

To ensure the continued security and safety of nuclear enterprises, the Penn State College of Engineering is formally introduced a nuclear security option in its nuclear engineering master's program. This unique master's degree program is designed to educate and train the next generation of nuclear security experts who can actively contribute to improving nuclear and radiological security around the world. This program is the first nuclear security master's degree program offered in the USA. The Penn State Nuclear Security master's degree program was created a grant from the United States Department of Energy and the National Nuclear Security Administration (NNSA). Initial development of the courses was prepared in collaboration with Massachusetts Institute of Technology and Texas A&M University. The Penn State program offered a comprehensive curriculum in nuclear security, primarily for graduate students studying nuclear engineering. This new nuclear security program will be a key resource to help develop the next generation of experts in nuclear security to continue this important work.

The nuclear security program at Penn State is unique and combines the technical, societal, and policy aspects of nuclear security and safety. Students in the program will gain experience with state-of-the-art technologies and be educated/trained in nuclear threat assessment and analysis, global nuclear security policies, and nuclear security system designs. By successfully completing the following five courses, students will receive the designation Master of Science or Master of Engineering with a nuclear security option and significantly expand their expertise on these critical issues.

- NucE 441, Nuclear Security Threat Analysis and Assessment: Nuclear threat assessment and analysis for nonstate actors to nuclear and radiological facilities and supply lines.
- NucE 442, Nuclear Security System Design: Science and engineering associated with the design, evaluation, and implementation of systems to secure nuclear and radiological materials.
- NucE 542, Source and Detector Technologies for Nuclear Security: Theory and technology behind detectors, sensors, and source technologies including portal monitors and field deployable radiation detection systems.
- NucE 543, Nuclear Security Education Laboratory: Hands-on experiences on the radiation detection systems, sensors, devices and source technologies for nuclear security applications.
- NucE 544, Global Nuclear Security Policies: Introduce students to global policies and laws for nuclear security that are intended to provide a secure environment for the pursuit of legitimate nuclear activities.

The courses were first offered in 2011, but the new master's degree option was formally offered to the students starting Fall 2018. Overall details of the Penn State nuclear security master's degree program will be presented.

### Gender

Male

### State

United States

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**Track Classification:** CC: Capacity building (e.g. human resource development and sustainability, nuclear security education and job-specific performance training including for newcomer countries)