



# HRD Activities in Nuclear Non-Proliferation and Nuclear Security at Chulalongkorn University

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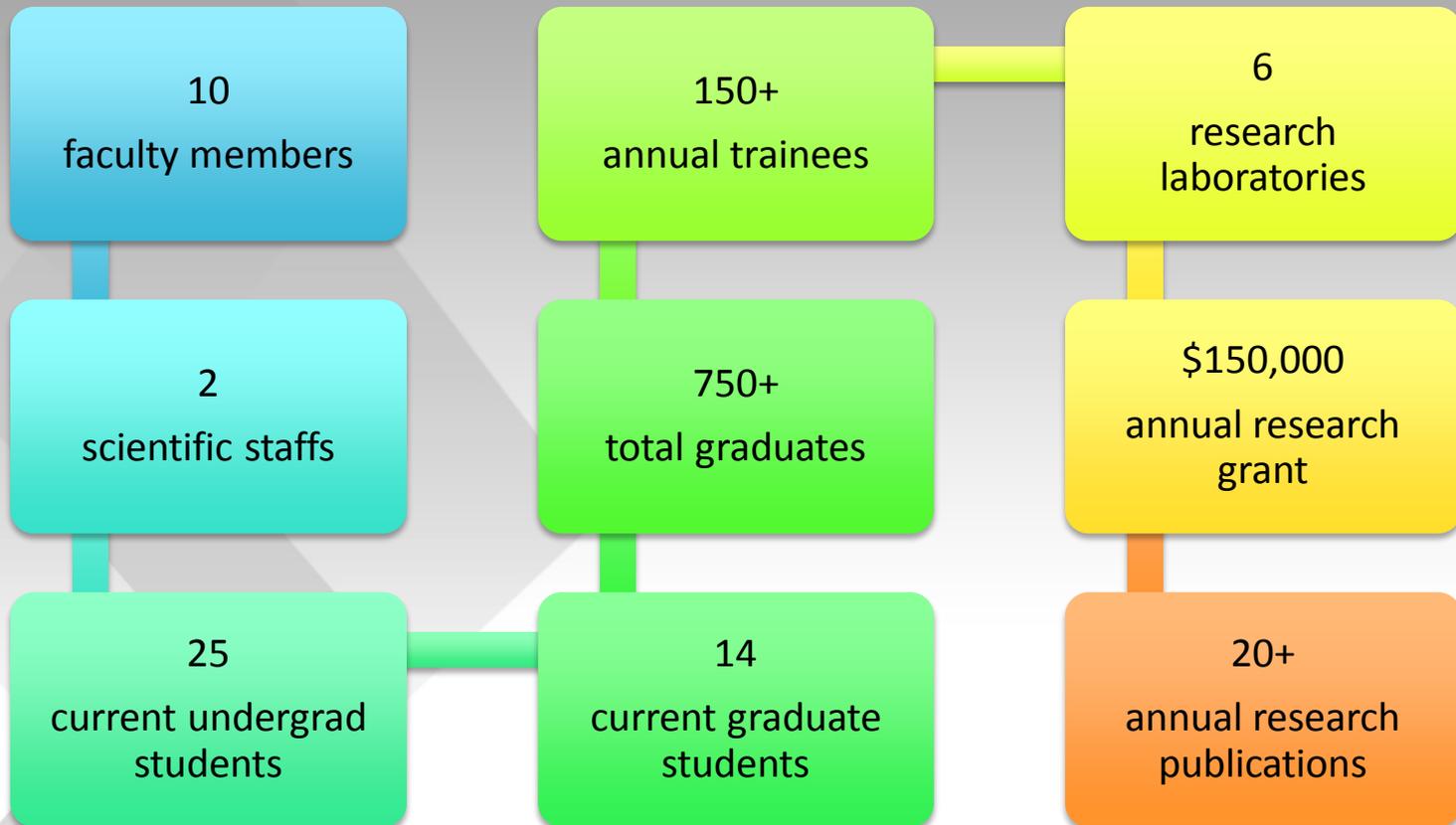
# NUCLEAR EDUCATION AT CHULALONGKORN UNIVERSITY



## Department of Nuclear Engineering

- Department of Nuclear Engineering was established under Faculty of Engineering in 1973 to initially develop human resources for Thailand nuclear power program.
- Thailand eventually did not go nuclear, but the department has been providing nuclear science and engineering education for the public ever since.
- It remains the only department that offers nuclear engineering education in Thailand--other institutions offer radiological science education.
- Four educational programs are currently offered
  - Bachelor of Engineering in Nuclear and Radiological Engineering (*Est. 2016*)
  - Master of Engineering in Nuclear Engineering
  - Master of Science in Nuclear Technology
  - Ph.D. in Nuclear Engineering

## Current Status



## Research Areas

Nuclear Electronics and Instrumentation	Nuclear Power Engineering	Industrial and Environmental Applications of Radiation & Radioisotopes	Radiation Imaging & Computed Tomography	Radiation Processing and Radiation Chemistry	Nuclear Engineering Materials	Plasmas and Nuclear Fusion	Nuclear Security and Safeguards
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# **NUCLEAR SECURITY AND SAFEGUARDS HRD ACTIVITIES**



# Educational Activities for Undergraduate Students

## ➤ Main Objectives

- Students have increase awareness of the security and safeguards issues in the utilization of nuclear and radioactive materials.
- Students recognize that the security and safeguards are also important components for the peaceful use of nuclear and radiation technology.
- Students have basic understanding of law and regulatory requirements, as well as general practices of how security and safeguards are established.

## ➤ Activities

- Nuclear security and safeguards are introduced as part of the “Nuclear Safety, Security, and Safeguards” course in the bachelor’s program.
- All students in the program are required to take this course.
- Security and safeguards components on the utilization of nuclear (and radioactive) materials are now also discussed in various courses in addition to the previous practice that only emphasized the safety component.

# Education Activities for Graduate Students

## ➤ Additional Objectives

- Students can further develop knowledge in the nuclear security and safeguards areas.

## ➤ Activities

- Nuclear security and safeguards specialization has been added to the master's and Ph.D. programs. (*International program*)
- 9 new courses have been added (25 credits or class 350 hours).

Nuclear Security

WMD Nonproliferation

Methods and Instrumentation for Nuclear Security and Safeguards + Lab

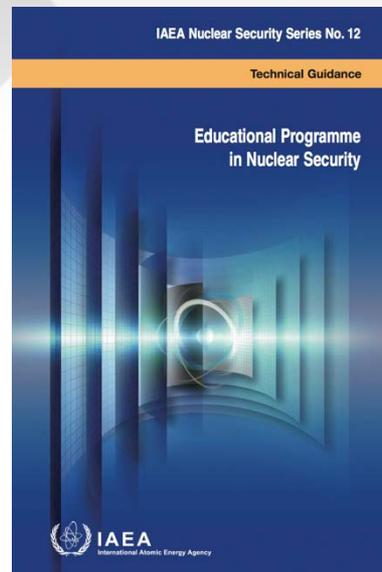
Strategic Trade Control

Nuclear Safeguards

Nuclear Fuel Cycle and Environmental Impacts

Physical Protection of Nuclear Materials and Facilities I

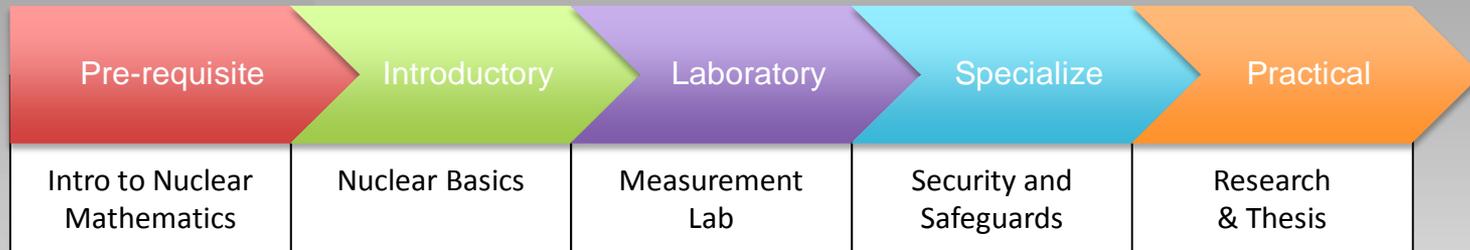
Advanced Detection Technologies for Radioactive and Nuclear Materials



Based on collaborations and assistances from

- ❖ EU CBRN CoE
- ❖ PNNL
- ❖ IAEA/INSEN
- ❖ UGA

# Education Activities for Graduate Students (con't)



## ➤ Output as of 2013

- 14 Non-Thai and 6 Thai students have enrolled in the program.
  - 18 graduated with master's degree
  - 2 graduated with certificate
- 18 publications in nuclear security and safeguards related areas.
- 15 students are now working in their respective countries in nuclear safety and security related area.
- Several are now pursuing Ph.D.
- 5 students from another specialization took some security and safeguards courses.



# Training Activities for Professionals

## ➤ Main Objective

- Trainees recognize the importance of nuclear security and safeguards.
- Trainees can apply knowledge to create SOP and execute it in their work.

## ➤ Activities

- Since 2009, the department has conducted trainings for the Thai Customs Department on the inspection of shipping containers at the Laem Chabang mega-seaport.
- Initially, the trainings were conducted jointly with the US-DOE under the Megaports Initiative.
- Two trainings have been provided annually.
  - Training for new customs officers
  - Refreshing training
- The trainings consist of lecture, TTX, and FTX.
- Instructors are invited from both Thai and international organizations.
- The trainings focus on second line defense, the usage of detectors, and response to alarm.

# Training Activities for Professionals (con't)

## ➤ Output as of 2009

- More than 500 officers from Thai Customs Department and other related organizations have participated in the training activities.
- Some participated as observers (for TTX and FTX).
- Joint SOPs have been developed for various security events.

