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Knowledge and Role of Technology in University's Non-Proliferation Culture

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POSTER

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Convergence of Education in Engineering, Research, Non-proliferation and Research Ethics

ABSTRACT

- The progress in free access to information on the internet shows an increasing role of security in scientific & innovative databases
- A lot of the unclassified information relates to dual use materials & technologies.
- Research is most vulnerable to unethical use because it generates and provides knowledge, materials, methods and technologies that could be channeled into crime or terrorism.
- Scientific researchers and engineers play a key and responsible role in non-proliferation. Researchers are the most knowledgeable and best placed professionally to assess the nature and seriousness of the potential for misuse
- University, indispensable for research, is one of the pillars of the prosperity and security of future generations.
- The diversification of research impose new ethical rigor hanging in the dissemination of the results.

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INTRODUCTION

The following activities can make a significant contribution to non-proliferation and disarmament:

- Education involves a wide range of activities and target groups, from public awareness to recruitment, training and strengthening of human resources in the field.
- Research, by sensitizing researchers to generate new results including dual-use, can contribute to proliferation and disarmament.
- The mentioned activities are within the competences of the University.
- We consider the need for the existence of a university course for nuclear safety, which also has the contribution of general culture.

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METHODS

The National Nuclear Security Support Center of the Technical University of Moldova initiated in 2017 a cooperation project with the Swedish Radiation Safety Authority (SSM), which financially supported the development of the Nuclear and Radiological Security Curriculum.

The elaboration of the Curriculum was based on:

- study of the Curricula mentioned disciplines existing in the EU countries;
- consulting the teaching staff on the INSEN IAEA platform;
- the inclusion of the discipline in the study program through the respective approvals of the university and ministerial normative framework;
- professional training of teachers through participation in seminars and workshops organized by the IAEA.

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RESULTS

- The course initially contained the modules:
  - ❑ Briefly about nuclear physics & Biological actions of ionizing radiation & Dosimetry units and values
  - ❑ International and domestic regulatory framework & Nuclear culture
  - ❑ Security, safety, nuclear guarantees & liaisons with non-proliferation
  - ❑ Illicit trafficking & Element of nuclear forensics

- The course is intended for master students, and initially contained 40 hours of lectures.
- The course is intended for master's students in Microelectronics and Nanotechnologies and Biomedical Engineering from the Technical University of Moldova.

- We mention that these master's courses are requested by 30% of graduates of the State University, the University of Medicine and Pharmacy and other faculties of the Technical University.

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RESULTS

- After 2 years the study modules were updated, increasing the share of non-proliferation, combating nuclear terrorism and individual research / study activities of master students. These actions were possible to support the project from SSM.
- A new module on the undoubted role of cybersecurity in non-proliferation has been included.
- The structure of the modules has been modified: The curriculum contains the same 40 hours, but dedicated to lectures - 20 hours, seminars 10 hours and individual research topics 10 hours.
- Individual research topics on the topics of the modules, including those adjacent to non-proliferation, are publicly defended, in the presence of colleagues, by other interested students.

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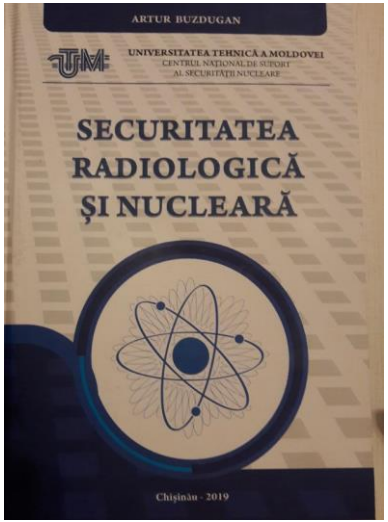
RESULTS

- A grid test of 60 questions required to be completed by master students in the evaluation process was developed in electronic format.
- About 30 master students are trained annually
- The manual (in Romanian) on Nuclear and Radiological Safety (337 pages, see on the right) was developed and published:



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CONCLUSIONS

- Considering the growing role of non-proliferation, the discipline of Nuclear and Radiological Safety benefits a large interest among master students.
- The discipline is intended not only for specialties that have tangents with the use of nuclear / radiological materials, their control e.g. at customs, but also for general culture increase.
- Scientific university professors, researchers and engineers play a key and responsible role in non-proliferation. They are the most knowledgeable and best placed professionally to assess the nature and seriousness of the potential for misuse and potential proliferation.

We would like to thank the Swedish Radiation Safety Authority for supporting the implementation of projects related to the teaching process in the field of nuclear safety and non-proliferation in TUM. SSM bear no responsibility for any use which may be made from information contained therein