



5-day training course in radiation protection

SCK•CEN (Mol, Belgium)

Objective

Since the early discoveries by Marie Curie, Bequerel, Einstein and many others, a deep insight into the risks and benefits of applying radioactivity in daily commercial and research practice has been build up. The scientific world of radiological protection is in constant motion, triggered by new research as well as by developments and events in the daily industrial and medical sector. In addition, national and international standards, regulations and guidelines aim at steering daily practice and procedures that guarantee the protection of workers, the public and the environment.

This training course treats the basic physics of radioactive phenomena and gives an overview of its most common applications. It shares the most recent knowledge on personal and environmental dosimetry and detection techniques, emergency management and biological effects of ionizing radiation. In addition, it focusses on the legal aspects regarding the use of radioactivity. Theoretical classes are complemented by a full day of practical exercises on the use of radiation devises and the correct application of personal protective equipment. Technical visits to some of SCK•CEN's installations and laboratories enrich and illustrate the acquired knowledge with the practice of real-life situations. And because working with nuclear technology requires not only technical knowledge but also an insight in the societal issues, a module is foreseen in which we stimulate thinking and discuss about the philosophical and ethical dimensions of justifying and using nuclear technology.

Target audience

Master or PhD students, or professionals working with radioactive materials or managing nuclear activities and requiring insight in fundamental and practical aspects of radiological protection.

Learning outcomes

Upon completion of the training course, participants will

in terms of knowledge

- Know and understand the origin, properties and applications of ionizing radiation
- Name and explain the interaction mechanisms between radiation and matter
- Name the main health risks related to exposure to ionizing radiation
- Understand and explain the fundamental principles of the radiation protection system and her applications, as laid down in national and international legislation
- Have insight in the organization of radiation protection in regular and emergency situations
- Understand the different dosimetric quantities
- Know different measurement methods and equipment for environmental and personal dosimetry
- Know the characteristics of Radon and naturally occurring radioactive materials



in terms of skills

- Be able to use different measurement devices to characterize sources and measure doses
- Apply proper dose reduction measures: reduce exposure time, increase distance, and select and calculate shielding
- Be able to develop contextual and ethical reasoning as a relevant skill when considering radiation protection issues

in terms of competences (autonomy, authority)

- Apply the main principles of operational radiation protection on the workforce on a daily basis
- Be aware of the complexity of nuclear applications

Topics

This training course contains the following modules:

- Radioactivity and nuclear physics
- Interaction of radiation with matter
- Applications of ionizing radiation
- Incidents and accidents - emergency management
- Ethical aspects of radiological risks
- Radon and increased natural radioactivity
- Dosimetry concepts
- Biological effects of ionizing radiation
- Radiation and dose measurements
- Legislation and practice of the ALARA philosophy
- Practical exercises

Language

This course is organised in English.

Duration

This 5-day training course is provided from 09h00 to 17h00, including two coffee breaks and lunch.

Registration

Registration is only available online on <http://academy.sckcen.be/en/Upcoming-events>.

Contact and venue

The course is held at the [Lakehouse](#) of the Belgian Nuclear Research Centre, Boeretang 201, BE-2400 Mol, Belgium.

Rooms can be booked at the [Lakehouse hotel](#) or at the [Alauda Hotel](#) in Dessel.

Further information is available via academy@sckcen.be or + 32 14 33 21 57.

<http://academy.sckcen.be>



Radiation protection course | 5 days

Programme

SCK•CEN Lakehouse

09:00 AM	10:30 AM	10:45 AM	12:15 PM	01:45 PM	03:15 PM	03:30 PM	05:00 PM
Monday Radioactivity and nuclear physics		Monday Radioactivity and nuclear physics		Monday Interaction of radiation with matter		Monday Interaction of radiation with matter	
Tuesday Applications of ionizing radiation		Tuesday Incidents and accidents – emergency management		Tuesday Ethical aspects of radiological risks		Tuesday Ethical aspects of radiological risks	
Wednesday Radon and increased natural radioactivity		Wednesday Dosimetric concepts		Wednesday Biological effects of ionizing radiation		Wednesday Biological effects of ionizing radiation	
Thursday Radiation and dose measurements		Thursday Radiation and dose measurements		Thursday Practical exercises nuclear measurement devices		Thursday Practical exercises nuclear measurement devices	
Friday Legislation and practice of the ALARA philosophy		Friday Legislation and practice of the ALARA philosophy		Friday Practical exercises PPM and contamination		Friday Visit of the anthropogammametry lab and the decontamination wing of the medical service	

