



Course on Nuclear Safeguards



Course Outline and Content

The course is aimed to provide an introduction to nuclear safeguards and the non-proliferation of nuclear weapons. Following the efforts of the European Safeguards Research and Development Association (ESARDA), this ANNETTE course contributes to enlarge the number of university students and young professionals aware of these themes.

The course units cover both technical aspects of nuclear safeguards inspections such as radiation detectors and nuclear fuel cycle facilities, as well as the history of nuclear non-proliferation and the relevant legal frameworks.

The course is made of the following units (the indicated time duration is approximate, and totals in the range of 50-60 hours):

- Unit 1 – History of non-proliferation and safeguards (4 hours lectures + case study assignment)
- Unit 2 – Legal frameworks (3-4 hours lectures)
- Unit 3 – Fuel cycle and non-proliferation (4 hours lectures)
- Unit 4 – Nuclear material accountancy (1-2 hours lectures)
- Unit 5 – Probabilistic and statistical methods for nuclear safeguards (4 hours lectures, 4 hours exercises)
- Unit 6 – Export control (4 hours lectures)
- Unit 7 – Implementation of safeguards (4 hours lectures)
- Unit 8 – Containment and Surveillance (C/S) (4 hours lectures)
- Unit 9 – Non-Destructive Assay (NDA) (4 hours lectures + 4 hours hands-on exercises, if possible)
- Unit 10 – Destructive Analysis (DA) (4 hours lectures + 2 hours desk top exercise)
- Unit 11 – Novel technologies, approaches and methodologies (3-4 hours lectures)
- Unit 12 – Physical protection (1-2 hours lectures)
- Unit 13 – Illicit trafficking (3-4 hours lectures)
- Unit 14 – Upcoming challenges (3-4 hours lectures)

Detailed Learning Outcomes are reported at [this link](#)

Approximate course date

4-15 February 2019

Locations

One week at SCK•CEN (Mol, Belgium), one week at FZJ (Jülich, Germany)

Number of attendees

A maximum of 60 attendees will be accepted

Requested Background

Due to the large scope of the course, no specific background is required to attend the course.

Teachers

The teaching units will be given by researchers from Forschungszentrum Jülich, JRC, SCK•CEN, and Uppsala University.

The full list of teachers will be communicated at a later stage.

Method of Delivery

Face-to-face lessons covering a period of two weeks. Links to the written course material will be provided at a later stage.

Final Examination

Mainly written questions on each learning unit. Exact modalities to be determined.