

Field: RADIATION PROTECTION

Topic: USE OF RADIOANALYTICAL EQUIPMENT FOR REGULATORY ACTIVITIES

Course type	TUTORING	Objective
Host institute	Jožef Stefan Institute, Ljubljana, Slovenia	This course provides tutees with a comprehensive understanding of essential theoretical concepts and practical proficiencies necessary for radiation measurement and radioanalysis of environmental samples. With the theoretical knowledge and practical skills acquired the tutees can improve their technical discipline competences and perform more effectively their regulatory functions in the respective fields.
Date	01 April – 26 April 2024	
Duration	Four weeks	
Working language	English	

Outline of course content

Theoretical training

The course provides comprehensive coverage of essential theories and practical skills in radiation measurement and radioanalysis of environmental samples in different exposure situations. Topics include gamma-ray spectroscopy, liquid scintillation spectrometry measurements, dosimetry and dosimetry standards, sampling and sample preparation, quality assurance, monitoring and reporting in environmental measurements. Furthermore, the course works out the roles and responsibilities of regulatory bodies and aids the interpretation of the international regulations and the related regulatory activities in terms of radioanalytical methods and exposure situations.

Theoretical concepts within each topic are reinforced through hands-on training and practical exercises designed to illustrate the fundamental principles underlying these theories vividly. The program encompasses various aspects, from exploring typical hardware/software configurations to discovering fundamental applications and features. These include signal processing basics, utilization of nuclide libraries, energy and efficiency calibrations, verification techniques, interpretation of analysis results, understanding counting statistics, configuring analysis settings, performing uncertainty calculations, and interpreting their outcomes.

Throughout the courses, participants will have ample opportunities to engage in laboratory exercises, utilizing actual instrumentation commonly found in typical counting laboratories. This hands-on approach ensures that participants understand the theoretical concepts and acquire practical skills that are directly applicable to real-world radiation measurements.

Practical work

- Laboratory activities and hands-on trainings at the host institute:
 - Hands-on experience with gamma-ray spectrometry
 - Hands-on experience with a liquid scintillation counter
 - Quench curve construction and interpretation
 - Efficiency calibration and activity measurement
 - Hands-on use of various dosimeters and measurement instruments
 - Analysis of dosimetry data and dose calculations
 - Instrument calibration
 - Practical session of sampling and sample preparation
 - Internal auditing techniques and procedures
 - Planning and executing audits
 - Corrective and preventive actions

- Technical visits to
 - analytical laboratories
 - other radiation, nuclear and supporting facilities

Technical schedule and delivery methods

The courses consists of classroom lectures, laboratory activities, hands-on trainings and technical visits during the 4 working weeks (i.e. 4 × 5 workdays).

- **Classroom lectures** will take 7 days with 2 units per a day (tentatively morning and afternoon sessions with 2 lectures of 90 minutes each, with time allocated for discussions and appropriate breaks).
- The **exercises, laboratory activities, hands-on trainings** will take 10 days with morning and afternoon sessions.
- The **site visits** will take 3 days.

Target audience

This course is intended to experts and professionals of Nuclear Regulatory Authorities (NRAs) and Technical Support Organisations (TSOs) preferably with responsibilities in the field of radiation protection and environmental monitoring.

Target number of participants: 2

Prerequisites and requirements for participants

Participants should have an adequate level of knowledge in English (at least an 'Independent user' level defined by the [CEFR](#)) and basic radiation protection knowledge. A university degree obtained in engineering, physics or chemistry faculties with nuclear specialization and at least 3 years of professional experience in functions relevant to the content of the course is also a prerequisite.

Relevancy of the course topic in the work and institutionally justified interest in participating will be considered as well as the need and opportunity for filling competence gaps. Efforts are made to ensure gender equality.

Terms of participation

The project is implemented under the European Union (EU) external assistance programme, called the European Instrument for International Nuclear Safety Cooperation (INSC), and aims to support the National Nuclear Regulatory Authorities (NRAs) and their Technical Support Organisations (TSOs) in non-EU countries in strengthening their capabilities with regard to their regulatory tasks and responsibilities in the field of nuclear safety and radiation protection.

Employees of the NRAs or their TSOs in the Beneficiary Countries are eligible for financially supported participation in the T&T courses. Beneficiary Countries of the project are published on the website <https://training.ek-cer.hu/>.

Costs

Travel and accommodation costs and subsistence allowances (including the international and national travel tickets, shuttle services, insurance and visa costs, per diems) for participants will be covered from the project budget.

Application

Application via the website <https://training.ek-cer.hu/>, according to the process and deadlines indicated there.

Examination

Technical and linguistic tests will be written as part of the application and selection process to assess the underlying knowledge and preparedness of applicants. Knowledge and development of selected participants will be assessed through technical tests throughout the course.

Work reports will be prepared to allow for progress monitoring and determining the final development through acquisition of knowledge, practical experience and expertise, as well as task completions.

Participants attending the full course will be issued with attendance certificates. Successful participants will receive certificates confirming their knowledge achieved and skills acquired.
