



Intensive 12 Weeks Radio-analytical Training Course at TAEC Laboratories in Arusha, Tanzania

Overview

Within the European Commission's INSC project TZ 3.01/14A "Support to the Regulatory Authority of Tanzania", an "Education outreach" **Course on Radio-analytical techniques** is organised at the TAEC laboratories in Arusha, Tanzania. TAEC maintains a well-equipped and qualified radio-analytical laboratory, which has been additionally enhanced through an INSC project that provided some of the most modern equipment. The equipment is installed in TAEC's newly commissioned laboratory and is used for various analytical tasks.

The Education outreach programme is meant to provide additional training and education opportunities to qualified applicants from the Region. The applicants are sought among the post graduate students or students in their final year of an undergraduate studies in closely related disciplines but also junior professionals, in particular those working in the national bodies being responsible for radiation monitoring or measurements. Through an intensive 12-weeks training, the participants will learn a variety of modern radio-analytical techniques and become qualified on the use of modern equipment. The training will be led by TAEC's highly competent staff supported by lecturers from leading analytical organisations in the EU, as well as from the University of Dar es Salaam. The Course will cover a variety of topics in the area of calibration, personal dosimetry, sample preparation, detection techniques and measuring of samples. While participating in the Course, the attendees will not only learn how to respond to modern challenges by selecting the appropriate methods and tools for various applications, they will also become fully familiar with different analytical techniques.

The participation in the Course is FREE OF CHARGE for qualified participants. The participants will be provided an air ticket from their home country to Arusha and back, local transport and the accommodation in Arusha, the lunches during the Course as well as a Stipend to cover the costs of food and incidentals including the costs of transportation from and to the airport in home country and Arusha. The amount of the Stipend is set to 1.500 Euro for the duration of the course. The Stipend will be provided in cash in Arusha, for every month in advance. At the successful completion of the Course, the attendees will obtain a Certificate documenting the completion of the Course.





The application is opened to qualified participants from Tanzania, Kenya, Namibia, Uganda, Rwanda, Burundi, Malawi, Zambia as well as to the EC CBRN CoE project P60 participating-countries including Ethiopia, DRC, Ghana and Seychelles. Up to 2 qualified participants from each of the eligible countries will be selected. The application will be evaluated jointly by ENCO, the INSC 3.01/14 A project implementer and TAEC. The applicants will be selected on the merits. The application shall be submitted to ENCO (n.bicakcic@enco.eu), using the attached application form.

The training will take place in groups of 8 to 10 participants, to enable full hands-on experience on all equipment and analytical methods. The first training course is expected to start on **February 24th 2020**. A subsequent course is expected to start on 25th May 2020.

The Programme

The Course will be held in English, therefore only the candidates with full fluency in English may be accepted. The Course will offer hands-on experience on a wide variety of practical methods and use of equipment for identification and quantification of radionuclides, dosimetry, and environmental monitoring. The Course will clarify a variety of methods and approaches in identification and measurement of radioactive matter. Practical activities including laboratory practices and precautions, preparation of samples, development of analysis reports but also personal dosimetry as well as whole body counting will be demonstrated and practiced. The Course will use simulated and actual (calibration level) radiation sources to demonstrate practical monitoring and detection approaches. Different kinds of samples will be measured to obtain practical expertise in the radio-analytical field.

The themes for the training will include:

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| 1 Interaction of radiation with matter | 2 Alpha spectroscopy |
| 3 Gamma spectrometry (HPGe) and multichannel spectroscopy (NaI) | 4 Sampling and measurement of samples from the environment |
| 5 Radon sampling and measurement, environmental radiation surveys | 6 Radiobiology and dosimetry, measures and quantities |
| 7 Internal and external exposure and protection | 8 Personal dosimetry |
| 8 X-ray fluorescence analysis | 10 Water quality measurement |
| 11 International recommendations and safety standards | 12 Handling of radioactive sources, including recovery of orphan sources |





Learning Outcomes

Upon the successful completion of the Course participants will be able to:

- Carry out equipment calibration;
- Understand the difference between various calibration methods;
- Grasp the need for carrying out equipment calibration with different geometry sources;
- Master the standards preparation and usage;
- Prepare samples for the various measurement techniques;
- Understand the different gamma spectrometry techniques;
- Obtain gamma spectra using NaI and HP Ge detectors;
- Analyse these spectra and quantify the measured radioactive isotopes;
- Perform and interpret total alpha (α) and beta (β) counting;
- Perform and interpret liquid scintillation counting;
- Perform and analyse radon, radium and actinides measurements;
- Perform sample measurements such as water, dry samples and vegetation;
- Develop a sound understanding of the challenges of forensic measurements where radioactive material is suspected to be present.

Requirements for the qualification of applicants

The applicants are expected to have a university degree in science (physics, chemistry, engineering or similar discipline) or be advanced in their undergraduate studies in those disciplines, or studying for an advanced degree (M.Sc.) in these areas. The applicants have to have full command of the English language to follow the lectures and participate in discussions.

Candidates having appropriate degrees that are the staff of national radiation and nuclear safety regulatory bodies and/or agencies tasked with monitoring of radioactivity in the environment and similar will be given priority. Staff of regulatory bodies or related laboratories not having undergraduate degree, but having relevant responsibilities for radio-analytical techniques will be accepted on a case by case basis, given justification by their organisation's management.





Schedule for the application

The applications – filled in Application form and details/evidence of the qualification of the applicant – will be accepted by **28th January 2020** for the Course starting in February 2020. Applications for the May course will be accepted by 28 April 2020. The applicants will be informed on the results of the selection at least 3 weeks in advance of the start of a course.

Applications endorsed by the National Focal Points within the EC CBRN CoE Initiative will be given priority.

In their application, the candidates shall indicate the Course (date) they apply for. In the case the Course on their preferred dates is fully booked, the applicants might be offered a place in subsequent Course, subject to availability.

Practical information

All selected participants will be provided return air tickets from their residence to Arusha, Tanzania. Upon arrival to Arusha, the participants will be provided the stipend for the first month (i.e. 500 Euro). At the end of the first and second month, the participants will be provided stipends for subsequent months (i.e. 500 Euro each). The stipend is to cover all of the subsistence and incidental costs. The housing will be booked by TAEC and provided to the participants free of charge.

Daily transport from Arusha city to the TAEC laboratories will be provided by TAEC free of charge to the participants. All laboratory supplies, including protective equipment and consumables will be provided by TAEC.

In case of an unjustified interruption of the Course (i.e. leaving the Course before its completion), participants will be obliged to return the amount of stipend already paid, as well as the air fare paid.

Contact Information

Additional information can be obtained from: b.tomic@enco.eu

