

# **Nuclear and related analytical techniques in archaeological and ecological studies**

## **Description**

Having the elemental composition of the archaeological artifacts helps in extracting more information about the age of cultural artifacts, habits, origin, and sources of clay raw materials. Implementation of neutron activation analysis is a powerful analytical technique in quantitatively and qualitatively the elemental abundances of the sample studied. The elemental composition of the artifacts and in particular ceramics and cultural heritage helps in extracting more information on the provenance of the found ceramics. The identification of the origin of the archaeological ceramics can be output in different ways depending on the extracted and available information in the archaeological sites.

On the other, NAA is not limited to be used only in archaeology but also in the environmental studies and solving of ecological problems. i.e. the physical, chemical, and biological properties of sediments, as well as the processes that contribute to their role as a monitoring tool, have been studied and confirmed by many organizations and committees. Heavy metals and other toxic substances in air, water, sediment, soil, and so on. So, the geochemical data that we obtained helped us to characterize these samples in terms of pollution and identify the sources of pollution. Later on, these data are considered as baseline data that can serve as a background value. Finally, statistical data analysis, quantification of the extent of contamination, and exposure assessment will be implemented.

## **Through practice, the participants should have the following:**

- Fundamentals of nuclear physics
- Gamma-ray spectrometer and related electronics
- Archaeology and related sciences
- Radioecology and related sciences
- Neutron activation analysis technique
- Processing of gamma spectra and data analysis
- Implementation of statistical data analysis in environmental studies

## **Requirements**

The applicant should have background in archaeology or environmental studies.

- Nuclear and radiation physics, nuclear chemistry, nuclear engineering
- Archaeology, art history, cultural heritage
- Ecology
- Language skills (English)

## **Scope**

Multidisciplinary in archaeological and environmental studies

**Where to get more information**

<https://orcid.org/0000-0002-5392-1319>

<https://www.scopus.com/authid/detail.uri?authorId=56600098900>

<https://scholar.google.com/citations?user=iYciXU8AAAAJ&hl=en>

<https://publons.com/researcher/2346987/wael-m-badawy/>

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