



Bringing Scientific and Technical resources to the African Continent (NITA/TRN/875)

## **HANDS ON PRACTICAL TRAINING ON ICP – OES BEST PRACTICES IN METHOD DEVELOPMENT, OPERATION AND TROUBLE SHOOTING (5-DAYS)**

### **Course Overview**

A comprehensive 5 day course designed to increase expertise and optimize results for all users of ICP-MS. Understanding sample introduction and optimization of instrument performance are important subject areas within this 5-days course. Interactive Training sessions and tutorial exercises are used to reinforce key learning points.

### **Who is this course for:**

This course is ideally tailored towards either the experienced user who is looking for a refresher course, or towards a new user who is looking for an introduction to the analytical technique.

### **Previous knowledge**

Background knowledge of ICP-OES or Mass Spectrometry may be useful but not necessary, as all the essentials are covered in the course. Previous experience using ICP-OES equipment can be beneficial.

### **What you will learn**

1. How the ICP source fragments in a different way to other MS techniques, offering a complementary view of the chemicals being analysed
2. Why ICP-OES is particularly suitable for isotope ratio studies
3. How ICP-OES can be used for the analysis of ultra-trace metal elements (0.0005-100ppb)
4. Application of ICP-OES to non-metallic elements (e.g. S, P)



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Day	Morning	Afternoon
<b>Monday</b>	<b>Welcome and opening remarks</b>  Opening Remarks <ul style="list-style-type: none"> <li>• Introduction of facilitators and meeting participants</li> <li>• Objectives of the training, expected outcomes and review of the agenda</li> </ul> Introduction <ul style="list-style-type: none"> <li>• Principles of spectroscopy</li> <li>• Principles &amp; operation of ICP-MS/OES</li> </ul>	<b>Laboratory session</b> <ul style="list-style-type: none"> <li>• Learning components of ICP, i.e. torch, detector, cones, spray chamber, nebulizer, tubing.</li> <li>• Assembling the sample introduction system</li> <li>• ICP gas requirements</li> </ul>
<b>Tuesday</b>	<b>Sample preparation techniques</b> <ul style="list-style-type: none"> <li>• Wet digestion</li> <li>• Dry ashing</li> <li>• Fusion</li> <li>• Microwave assisted digestion</li> </ul>	<b>Laboratory session</b> <ul style="list-style-type: none"> <li>• Preparation of organic sample</li> <li>• Preparation of inorganic samples</li> <li>• Preparation of difficult samples</li> <li>• Software basic and instrument set-up</li> </ul>
<b>Wednesday</b>	<b>Calibration methods</b> <ul style="list-style-type: none"> <li>• Internal standard</li> <li>• Standard addition</li> <li>• Calibration curve</li> </ul> Use of quality controls <ul style="list-style-type: none"> <li>• Internal QCs – spiking, HRM, replicate testing</li> <li>• External QCs – CRM, PTs, ILC</li> </ul>	<b>Laboratory session</b> <ul style="list-style-type: none"> <li>• Preparation of standards</li> <li>• Preparation of QCs</li> <li>• Method development</li> <li>• Sample analysis using ICP</li> </ul>
<b>Thursday</b>	<b>ICP interferences</b> <ul style="list-style-type: none"> <li>• Matrix interferences</li> <li>• Spectral interferences</li> </ul> Data analysis <ul style="list-style-type: none"> <li>• Sample concentration</li> </ul>	Analysis of data Cleaning of ICP
<b>Friday</b>	Trouble shooting and maintenance Instrument tuning	Course overview Conclusion
<b>7<sup>th</sup> – 11<sup>th</sup> November 2022</b> <b>Deadline: 24<sup>th</sup> October 2022</b>	<b>Cost: Kes. 92,800.00 or USD 928.00</b> <b>Vat Inclusive</b>	<b>Venue: Nairobi</b>