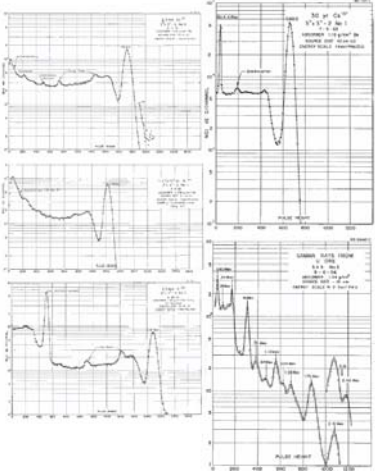


# Gamma Spectroscopy Applications

September 24-28, 2018 ♦ Orlando, FL ♦ Course Fee: \$1295



This 5-day course is designed to remove the 'black-box' approach to gamma spectroscopy results. (i.e., Put the sample on the detector, push the button, read the printed report, accept the results). It will provide a solid basis in the fundamentals of gamma spectroscopy while focusing on the areas that permit the operator to prepare a representative sample, optimize system parameters, understand the effects of cascade summing, interference peaks, geometry, and libraries parameters. Class exercises guide the student through the interpretation of results with consideration of peak fit, source term and process knowledge of the sample. Laboratory QA and good practices are also discussed. Time-permitting, students will be introduced to the concepts and benefits of modeled geometries and in situ measurements.

This course will also provide an overview of the hardware and techniques employed in gamma-ray spectroscopy and provide an understanding of the fundamental physical processes underlying their application. The primary focus of the course is HPGc detectors although applications of NaI(Tl), CZT and LaBr3(Ce) detectors are included as applicable to the course participants.

The course will review basic radioactive decay theory and interaction of radiation with matter to explain spectral features and their interpretation, including peak identification and energy determination, backscatter peaks, single and double escape peaks and proper use of control charts.

This course is designed to provide a practical introduction to gamma spectroscopy for those new to the field of gamma spectroscopy, but also provide practical applications to those who are currently performing gamma spectroscopy. The course is intended for radiochemists, technicians and others who will be doing routine and specialized gamma spectroscopy, as well as quality assurance officers and data validators who may have a need to understand gamma spectroscopy measurements.

## THIS COURSE WILL HELP YOU....

- Gain a solid background in the fundamentals and theory of gamma spectroscopy.
- Learn which factors in sample preparation insure that the sample is representative of the efficiencies used for calculating results.
- Understand the effects of cascade summing, interference correction, fluorescent x-rays and other areas that are not often addressed.
- Learn to optimize your libraries and software parameters.
- Establish a defensible QA program that works for the laboratory.
- Understand the application of Data Quality Objectives
- Find and use applicable reference materials.
- Understand why results printed out on the report are not always applicable to the sample being analyzed.

## Onsite Training

Looking for a cost effective way to train 5 or more people?

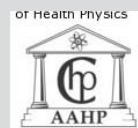


Onsite training is a great solution for many companies.

With training dollars being stretched more than ever, you get maximum value with an onsite course.

Save up to 50% over open enrollment courses...AND each course is customized to your specific needs.

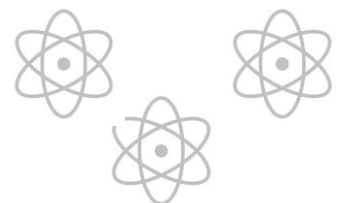
Contact TMS for further details.



THE AMERICAN ACADEMY OF HEALTH PHYSICS (AAHP) HAS AWARDED THIS COURSE 40 CONTINUING EDUCATION CREDITS.

**FOR FURTHER INFORMATION OR ASSISTANCE, PLEASE CONTACT:**

Technical Management Services  
Phone: 1-860-738-2440  
Fax: 1-860-738-9322  
info@tmscourses.com  
www.tmscourses.com



## Topics

### Review of Fundamentals

- ♦ Spectral Characteristics
- ♦ Transient and Secular Equilibrium
- ♦ Decay Corrections
  - a. Short Lived Nuclides Decay During Counting
  - b. Buildup
  - c. Neutron Activation
- ♦ Peak Shape and Fitting What it is and What it Means.
- ♦ Decay Schemes/ Gamma Abundance
  - References

### Review of Electronics and Effects on Spectral Results

- ♦ Pole zero
- ♦ ADC
- ♦ Dead Time
- ♦ High and Low Count Rate Considerations

### Calibration

- ♦ Energy and Shape Calibrations
- ♦ Fixed Geometry Efficiency Calibration Considerations
- ♦ Modeled Laboratory Geometry Considerations
- ♦ In Situ Field Geometry Considerations

### Counting Statistics

- ♦ Counting Error
- ♦ MDA/ Critical Level Calculations
- ♦ Total Propagated Uncertainty

### How Does the Software Identify A Nuclide

- ♦ Peak Search and Fit
- ♦ Interactive Peak Fit
- ♦ Interference Corrections
- ♦ MDA/LLD/ Critical Level
- ♦ Analysis Parameters which affect Results

### Summation Error Corrections

- ♦ Random Summing
- ♦ Coincidence (Cascade) Summing Correction

### Library Parameters

- ♦ Selecting Key Lines
- ♦ Selecting Confirming Peaks
- ♦ Use of Lines from Progeny for Quantification of a Nuclide
- ♦ Optimizing the Library to the Software

### Reviewing Spectra

- ♦ Exercises

### Unidentified Peaks

- ♦ Why Resolve These Peaks?
- ♦ How to Resolve These Peaks.

### Quality Assurance

- ♦ Establishing Parameters
- ♦ Trending Charts
- ♦ Control Charts
- ♦ Verification of Efficiency Calibrations
- ♦ ANSI N42.23

## ACCOMMODATIONS



This course will be held at the Orlando Airport Marriott Lakeside. A block of rooms has been reserved at reduced rates for course participants. Please

make your reservation directly with the hotel by calling 407-851-9000 – please specify that you are attending Technical Management Services' short course to receive the group rate.

The reserved block of rooms will be released 3 weeks prior to the course (at which time rooms will be offered on an availability basis only).

## HOW TO REGISTER ...

Visit our website at [www.tmscourses.com](http://www.tmscourses.com) and register online, or call 860-738-2440.

Registration questions can be emailed to [info@tmscourses.com](mailto:info@tmscourses.com)

## CANCELLATION POLICY:

Cancellations are accepted up to three weeks prior to the start of the course. After this time a \$100 cancellation fee will be charged. Registrants who cancel within 1 week of the course will be liable for the full course fee. Occasionally, enrollment for a course is low and it becomes necessary for us to cancel the course. We apologize for any inconvenience a cancellation may cause and will make every effort to reschedule the course or make other arrangements for you.

In the event TMS may cancel a course due to low enrollment, notice will be given 2 weeks prior to the class.