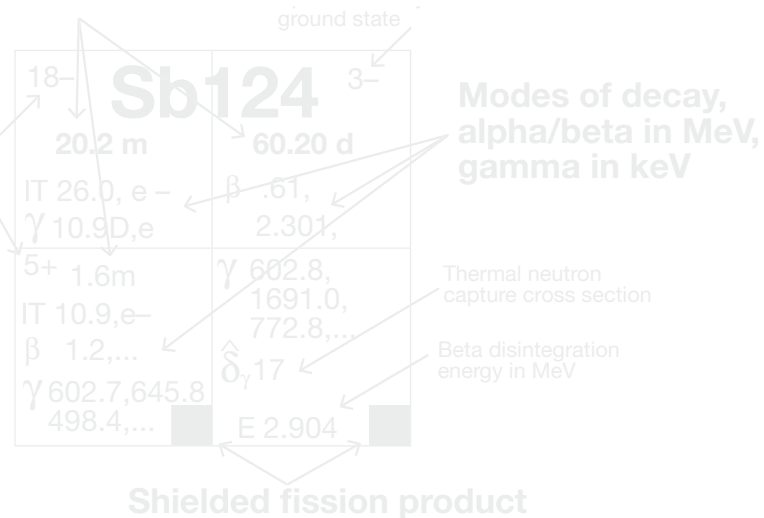


## Advanced Gamma Spectroscopy



A Sciencetech  
Training Course

February 23-25 2016  
Clearwater, Florida

## ▶ Course Overview

This special topic course discusses the theory and application of gamma-ray spectroscopy systems for identification and quantification of radionuclides.

In the bonus workshop you will have the opportunity to test what you have learned. Real-life case studies from various nuclear power plants will be presented. Students will analyze and discuss the actual gamma spectra from these case studies.

**NOTE:** Students are encouraged to send their own gamma spectra to the instructor 2-3 weeks prior to the class so he can include it in the workshop analyses.

Instructor - Greg Jones (gregory.jones3@exeloncorp.com)

---

## ▶ What's Included:

- The full course text
  - All hand-outs and case studies
  - Chart of the Nuclides textbook - yours to keep
  - Continental breakfast Tuesday, Wednesday, & Thursday.
  - Lunch in the Sheraton's Island Grille Café Tuesday and Wednesday
  - Morning and afternoon refreshment breaks
- 

## ▶ Who Should Attend

This course is appropriate for personnel with a bachelor's degree in a technical area or an equivalent combination of experience and education. Prior experience in gamma spectroscopy is recommended.

# ► This Course Covers

This course has been completely revised and updated. It now includes comprehensive information divided into the following sections:

## **Gamma Ray Detection**

### **Principles**

- Semiconductor Theory
- Semiconductor Characteristics
- Semiconductor Detectors

### **Semiconductor Detector Systems**

- Pulse Height Analysis
- Detector System Components
- System Dead Time
- MCA Memory Considerations

### **Gamma-Ray Interactions and Spectral Features**

- Interaction Mechanisms
- The Gamma-Ray Spectrum
- Detector Geometry Effects
- Spectral Peak Characteristics
- General Spectral Features
- Spectral Background Effects

### **Gamma-Ray Spectroscopy System Calibrations**

- First Order Energy Calibrations
- Second Order Energy Calibrations
- Efficiency Calibrations

### **Power Plant Sources of Gamma-Ray Activity**

- Coolant Activation Products
- Corrosion and Wear Products
- Fission Products

- Transuranics
- Tritium
- Power Plant Activity Levels

### **Software Assisted Spectral Analysis**

- Channel-by-Channel Data Reduction
- Determination of Peak Location
- Determination of Peak Intensity
- Nuclide Identification Techniques
- Validation of Nuclide Library Entries

### **Spectral Verification Practices**

- Chart of the Nuclides
- Assessment of Secondary Spectral Features
- Interference Correction Techniques
- Visual Analysis Techniques
- Verification of Power Plant Nuclides
- Half-Life Studies
- Parent-Daughter Equilibrium
- Statistical Considerations of Small Spectral Peaks
- Quality Control Techniques

### **Sample Collection and Preparation for Gamma-Ray Analysis**

- Sample Collection at System Temperature and Pressure
- Crud Samples
- Liquid Samples
- Filtrate Samples
- Stripped Gas Samples

## ▶ About the Instructor



Mr. Greg Jones has 35 years of experience in Analytical Chemistry including 30 years of experience in Nuclear Power. During his career Greg has been the program owner responsible for Primary and Secondary Chemistry, In-Line Analyzers, Effluent Radiation Monitors, RETS and REMP.

He developed Statistical Process Control protocols for in-line analyzers, in situ gas verification of residual signal in polarographic membrane oxygen analyzers, statistical protocols for B-10 content in borated stainless steel spent fuel racks, and radiation monitor setpoints for RCS leak detection.

Mr. Jones has the Bachelor of Science in Chemistry from Auburn University, the Master Of Science in Geochemistry from the University of Rochester, and the Master of Science in Applied and Mathematical Statistics from the College of Engineering at Rochester Institute of Technology.

Greg studied Advanced Gamma Spectroscopy under Jim Key of Quantum Technologies and supervises the Counting Lab at his plant.

Mr. Jones is a Certified Quality Engineer under American Society for Quality and is a member of the ASTM Chemistry Sub-committee.

## ▶ Course Schedule

### **Tuesday, Wednesday, February 23-24, 2016**

7:30 am	—	8:00 am	Continental breakfast in classroom
8:00 am	—	12:00 noon	Course w/morning break
12:00 noon	—	1:00 pm	Lunch at Sheraton's Island Grille Café
1:00 pm	—	5:00 pm	Course w/afternoon refreshment break

### **Thursday, February 25, 2016**

7:30 am	—	8:00 am	Continental breakfast in classroom
8:00 am	—	12:00 noon	Course w/morning break

.....

## ▶ Registration Information

### **Advanced Gamma Spectroscopy**

The registration fee is \$3220.00 per attendee and includes all course materials; continental breakfast each day; full lunch in Sheraton's Island Grille Café each day; afternoon refreshment breaks each day, and a Certificate of Educational Achievement for each student that successfully completes the course.

Register on-line at our secure web site:

*[www.chemistryapplications.scientech.com](http://www.chemistryapplications.scientech.com)*

1. In the menu in the middle of the screen, click **Event Schedule**
2. Under the 2016 heading, click **Advanced Gamma Spectroscopy February 23-25**
3. Click **Registration** in the menu box on the left side of the screen
4. Enter the registrant's e-mail address and leave the ID Code Box blank
5. Click **Continue** to complete the registration
6. A confirmation will be sent to you via e-mail



The latest information on all Sciencetech Chemistry training courses and meetings is available on our Web site at ***[www.chemistryapplications.scientech.com](http://www.chemistryapplications.scientech.com)***



**Cancellation Policy**

Sciencetech reserves the right to cancel this course at any time and refund the full amount of all registration fees paid. Sciencetech must have a minimum number of students to hold this course. When the minimum number of attendees is reached, Sciencetech will send a notice (21) days prior to the course start date, that the required quota has been met or the course has been cancelled. Any cancellations made after the date of the notification e-mail, the attendee will be charged a 75% cancelation fee.

Note: We must have a minimum number of students to hold this course. Please do not make any non-refundable travel reservations until we tell you that the course will definitely be held as scheduled.

**Hotel**

A block of rooms has been reserved at the Sheraton Sand Key Resort at the rate of \$222. per night. Please make your hotel reservations directly with the Sheraton by calling 727.595.1611. Be sure to specify that you are attending this Sciencetech course to receive the reduced rate. The room block will be released 30 days before each course. After that, the Sheraton cannot guarantee rate or availability.

**Contact Information:**

For general information contact Rose Kieffer at:  
Voice: 727.669.3005  
Toll-free: 800.637.2743 x 3055  
Fax: 727.669.3100  
Email: [rkieffer@curtisswright.com](mailto:rkieffer@curtisswright.com)