YOUR BENEFIT FROM TRAINING

Our classroom training offers an ideal setting for learning how to get the best possible performance from your instrument. Free from everyday distractions, you'll receive hands-on experience in a laboratory environment complete with the latest equipment, software and accessories. You'll receive guidance from expert faculty with comprehensive instrument knowledge and experience. You'll also have the opportunity to network with other participants to problem solve.

Training courses are offered at PerkinElmer Centers of Excellence, conveniently located throughout the United States and Canada. We maintain a small class size to ensure you receive individual attention and ample hands-on instrument use – everything you need for focused learning that can lead to increased productivity.

Participants are accepted on a first-come, first-served basis, so reserve your spot soon.

UNABLE TO GET AWAY FROM YOUR LAB?

Contact us to discuss bringing the training directly to you – saving you time and travel expenses. Email OnsiteTraining@perkinelmer.com for more information.

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## ATOMIC SPECTROSCOPY

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**INDUCTIVELY COUPLED PLASMA (ICP-OES)**

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**ICP MASS SPECTROMETRY (ICP-MS)**

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## CHROMATOGRAPHY

### GAS CHROMATOGRAPHY (GC)

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### LC MASS SPECTROMETRY (LC-MS)

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**CHROMATOGRAPHY DATA SYSTEMS (CDS)**

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**MOLECULAR SPECTROSCOPY**

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<td>Spectral Interpretation</td>
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**THERMAL/ELEMENTAL ANALYSIS**

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<td>Intro to Thermogravimetric Analysis</td>
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### Atomic Absorption

**N020-5001 | 2 Days | Tuition $1,450**

#### Flame Atomic Absorption

This two-day course provides the analyst with the knowledge and skills needed for optimizing and troubleshooting basic flame atomic absorption. Laboratory exercises include experiments in controlling interferences as well as procedures for developing methods. WinLab and Syngistix™ software will also be covered.

**Prerequisite**
The analyst should have spent at least one month becoming familiar with the instrument and should have a working knowledge of Microsoft® Windows and AA WinLab software before attending this course.

#### Lectures and Labs
- Hardware optimization and calibration
- Setting up the element parameter file
- Maintenance procedures
- Background correction
- Flame emissions analysis
- Interferences

### Graphite Furnace Atomic Absorption

**N020-0017 | 3 Days | Tuition $2,050 (if not included w/instrument purchase)**

This three-day course will provide the analyst with the knowledge necessary to set up, run, troubleshoot, and operate the graphite furnace. A considerable portion of this course is devoted to understanding the capabilities of the WinLab and Syngistix software used to operate the system. The course begins with the basics of graphite furnace atomic absorption (GFAA) and concludes with the most recent developments in the technique including simultaneous graphite furnace analysis.

**Prerequisite**
The student should have spent at least one month becoming familiar with the instrument and should have a working knowledge of Microsoft® Windows and AA WinLab software before attending this course.

#### Lectures and Labs
- Introduction to GFAA
- Setting up the element parameter file
- Interferences
- Matrix modifiers
- Background correction systems
- Quality control
- Method development
- Optimization of simultaneous analysis parameters (SIMAA)
- Troubleshooting and maintenance

### Advanced Furnace AA

**N020-0024 | 2 Days | Tuition $1,450**

This two-day laboratory intensive course, which will focus on how to handle difficult samples. The modifier and its role in solving analytical problems will be discussed in detail. The class will examine complex matrices, focusing on peak plot interpretation as a means to method development. Techniques such as QA/QC as a means of verifying the accuracy of data will be discussed. Class participants will be expected to have a good working knowledge of the software as this will not be addressed in the course. This course is not for the novice. The basic techniques of graphite furnace and an extensive knowledge of the Microsoft® Windows-based software will be expected.

**Prerequisite**
The student should have completed course N020-0017 (basic Graphite Furnace) or have a minimum of six months experience with graphite furnace analysis and the WinLab software before attending this course.

#### Lectures and Labs
- Method optimization
- Quality control for method validation
- Peak plot interpretation
- Solid sampling
- Understanding modifiers
Inductively Coupled Plasma

N020-5010  |  3 Days  |  Tuition $2,050 (if not included with instrument purchase)

**Inductively Coupled Plasma Series**

This three-day comprehensive course comprises a study of basic emission theory, radial versus axial viewing, ICP hardware, and WinLab 32 and Syngistix software. All lab experiments will be conducted on current models of the PerkinElmer ICP series.

**Prerequisite**
Analysts should have spent at least one month becoming familiar with the instrument and should have a working knowledge of WinLab 32 and/or Syngistix software before attending this course.

**Lectures and Labs**
- Theory of atomic emission
- Plasma performance
- Identifying and overcoming interferences
- ICP component
- Data reprocessing
- Radial vs. axial viewing
- Method development
- Background correction
- Multicomponent Spectral Fitting (MSF)
- Interfering Element Correction (IEC)
- Echelle optical system maintenance
- Parameter optimization

N020-0027  |  2 Days  |  Tuition $1,450

**Advanced Optima ICP**

This two-day course provides analysts with the knowledge needed to develop a method for ICP-OES analysis of complex samples. This lab intensive course covers when and how to use internal standards, inter-element correction factors (IECs) and multi-component spectral fitting (MSF) effectively to obtain accurate results.

**Prerequisite**
The student should have completed course N020-5010 (ICP with ICP WinLab and Syngistix software) or have a minimum of six months experience with the Optima/Avio ICP and the WinLab/Syngistix software before attending this course. This course is not recommended for beginners.

**Lectures and Labs**
- Identifying interferences
- Inter-element correction factors
- Using internal standards
- Multicomponent spectral fitting
Inductively Coupled Mass Spectrometry

N020-0193 | 5 Days | Tuition $3,150 (if not included w/instrument purchase)

**NexION ICP-MS Instrumentation**

This five-day course will cover the NexION® series of ICP-MS. This course will be a combination of classroom lectures and hands on laboratory experiments and exercises. The items covered will consist of the following:

- ICP-MS theory and method development
- Overview and discussion of the hardware of the
- NexION/Sygistix software training
- Discussion on optimization and setup of the instrument
- Introduction into the optimization and the use of
- Universal Cell Technology (UCT)
- Troubleshooting, and maintenance
- Reporting and data exporting

**Prerequisite**

Students should have spent at least one month becoming familiar with the instrument, and should have a working knowledge of the software before attending this course.

*An experiment on how to use the autosampler will be covered in class however ESI Autosampler material will NOT be covered.*

Also part of this course material, appropriate lab exercises will be conducted that are related to the discussions held. Laboratory experiments will be conducted to show how to set up, optimize and maintain the ICP-MS instrument. In addition, data will be collected by means of various analytical methods available with this technique. All lab experiments will be conducted on the NexION models of ICP-MS instruments.

N020-0522 | 3 Days | Tuition $2,050

**LC/ICP-MS Instrumentation-Metal Speciation**

This three-day advanced course will cover the concept and implementation of speciation analysis by coupling the analytical techniques of inductively coupled plasma emission mass spectrometry (ICP-MS) and liquid chromatography (LC). This course will include a one-day primer on LC, a review of ICP-MS optimization and the interfacing of the two techniques.

Also included is basic training on how to use the Chromera® software. Laboratory experiments will be conducted to show how to set up this technique and collect data. This data will be collected using two of the available modes of LC. All lab experiments will be conducted on the current models of the ICP-MS, LC pump and autosampler.

**Prerequisite**

Students should be very familiar with the ELAN series of ICP-MS instrumentation and should have a strong working knowledge of the ELAN software before attending this course. Ideally students should have attended the basic ICP-MS course (course number N020-0008).

**Lectures and Labs**

- Introduction to Databases
- Fundamentals of HPLC
- Interfacing HPLC to ICP-MS
- HPLC Hardware Familiarization
- Selenium Speciation
- Review of ICPMS Optimization
- Software (Chromera)
- HPLC Troubleshooting
- Computer Based Software Exercises
- Arsenic Speciation
### Liquid Chromatography

**N020-0501 | 2 Days | Tuition $1,450**

**Fundamental Liquid Chromatography**

For the beginner, this two-day introduction to liquid chromatography provides an overview of the principles and practice of high-performance liquid chromatography (HPLC). The topics covered are basic chromatographic terminology, modes of HPLC (normal and reversed-phase, size exclusion, and ion exchange chromatography), instrumentation, peak identification and method development, a brief applications review, and routine maintenance and troubleshooting.

**Prerequisite**
The student should have spent at least one month becoming familiar with the instrument.

### Chromatography Data Systems (CDS)

**N022-3025 | 3 Days | Tuition $2,050**

**Empower Quickstart**

This three-day lecture and lab course Presents users of Empower 3 Workstation with a fundamental knowledge of the Quickstart interface. This course is for key operators who need formal product training or operators who need more comprehensive training than that supplied by on-site familiarization courses.

**Prerequisite**
A fundamental understanding and/or experience using Microsoft® Windows® 7 operating system is strongly recommended for this course. 20 to 60 days of product usage before the class is recommended.

### TotalChrom Principles of Operation

**N020-1043 | 3 Days | Tuition $2,050**

**Lectures and Labs**

- System overview
- PerkinElmer Intelligent Interface
- Software configuration
- Peak detection and identification
- Generation and calibration of method files
- Data acquisition
- Graphic reprocessing
- Comparing chromatograms
- Batch
- Generation of sequences
Gas Chromatography

N020-0407 | 3 Days | Tuition $2,050

**Fundamental Gas Chromatography**

This three-day course provides an overview of the basic principles, hardware, and operational techniques used in gas chromatography, along with column overview.

**Prerequisite**
The student should have spent at least one month becoming familiar with the Clarus instrument.

*Note: Students in need of detailed instruction using TotalChrom software should attend the appropriate Chromatography Data Systems course.*

**Lectures and Labs**
- Basic principles of GC
- Starting a chromatograph
- Hardware, gases, injectors, column installation, flow measurements, detectors, etc.
- Setup of GC and data handling
- Qualitative and quantitative analysis
- Principles and optimization of data-handling parameters

---

GC Mass Spectrometry

N020-0417 | 4 Days | Tuition $2,700 (if not included with instrument purchase)

**GC-MS Operator**

This four-day course introduces new Clarus® GC/MS and users to gas chromatography/mass spectroscopy (GC/MS) and gives them an orientation to the hardware, software, and experimental requirements to accomplish successful system operation. Laboratory exercises provide an opportunity to carry out the main operations described in the lecture material.

**Prerequisite**
Students are required to have completed one of the PerkinElmer gas chromatography training courses, or to certify a history of extensive GC experience. The student will also be required to have at least one month of experience with an installed and operating Clarus MS system.

**Lectures and Labs**
- System maintenance and software troubleshooting procedures
- Connecting the GC and MS
- Spectral data processing and cold starting the instrument
- Library searching
- Tuning the instrument
- Developing a method for construction and data analysis
- Instrument control and data acquisition
- Developing a Clarus MS method for quantization and a GC control method
- General maintenance
## GC Mass Spectrometry

### Torion GC/MS Basic Operations
This three-day class will cover basic operations of the Torion T-9 Portable GC/MS system. Topics will include:
- Setting up the instrument for laboratory or field use
- Basic SPME sampling techniques for Gas and liquid samples
- Start up and preparation
- Conducting Performance Validation runs to ensure correct operation of the system
- Basic data viewing and analysis using Chromion Software
- Very basic maintenance for the T-9 GC/MS and SPME Custodion

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<tr>
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### Torion GC/MS Advanced Operations
This five-day class will cover advanced operations of the Torion T-9 Portable GC/MS system. Topics will include:
- Advanced data analysis using Chromion software
- Building custom target lists and unknown libraries in Chromion
- Air Sampling using the Custodion Needle Trap and Clarion air pump

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<tr>
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LC Mass Spectrometry

AxION 2 DSA

**Prerequisite**
ChromAcademy LC and LCMS online training.
Understanding of basic MS theory and operation (1-2 years) recommended.

**Lectures and Labs**
- Use the ToF Driver Software to Tune and Calibrate the ToF MS
- Use Autotune to refine Tune files and detector voltages
- Connect/configure the system with the AxION DSA to perform Direct Sample Analysis
- Build Acquisition methods for the DSA/ToF MS
- Run Samples as a DSA/ToF using the DSA controller
- View and Analyze DSA ToF data using the ToF Driver and AxION Solo

AxION 2 LC/DSA

**Prerequisite**
Fundamental LC training course, or a minimum of one year experience running an LC instrument.
ChromAcademy LC and LCMS online training.
Understanding of basic MS theory and operation (1-2 years) recommended.

**Lectures and Labs**
- Use the ToF Driver Software to Tune and Calibrate the ToF MS
- Use Autotune to refine Tune files and detector voltages
- Build Acquisition methods for the LC/ToF MS and for the DSA/ToF
- Connect/configure the system with the Flexar LC system to run the system as an LC/ToF and with the AxION DSA to perform Direct Sample Analysis
- Run Samples as an LC/ToF using Chromera and as a DSA/ToF using the DSA controller
- View and Analyze LC/ToF and DSA ToF qualitative and quantitative data

AxION 2 LCMS

**Prerequisite**
Fundamental LC training course, or a minimum of one year experience running an LC instrument.
ChromAcademy LC and LCMS online training.
Understanding of basic MS theory and operation (1-2 years) recommended.

**Lectures and Labs**
- Use the ToF Driver Software to Tune and Calibrate the ToF MS
- Use Autotune to refine Tune files and detector voltages
- Build Acquisition methods for the LC/ToF MS including the use of EIC data channels and LockMass Calibration
- Connect/configure the system with the Flexar LC system in order to run the system as an LC/ToF
- Run Samples as an LC/ToF using Chromera
- View and Analyze LC/ToF data using both the ToF Driver (qualitative) and Chromera (quantitative)

QSight® Triple Quad LC/MS/MS

**Prerequisite**
Students are required to have basic knowledge on mass spectrometry and chromatogram. It would be ideal to have LC-MS working experiences including LC and MS method development. The students are also required to have at least one month of experience on the installed and operating Qsight LC-MS system.

**Lectures and Labs**
- Overviews including the fundamentals of mass spectrometry, Qsight technology, Simplicity software, basic applications, and basic maintenance and troubleshooting.
- Hands-on practices including instrument tuning and calibration, Qsight Acquisition and Simplicity software familiarization, method development, sample preparation and data analysis, and basic maintenance and troubleshooting.
Infrared Spectroscopy

N020-0126 | 2 Days | Tuition $1,450

**Introduction to FT-IR and Spectrum Software**

This two-day fundamental course provides instruction in theory, instrumentation, maintenance, data acquisition software, sample preparation and the use of various accessories, enabling students to acquire good quality spectra by either reflectance or transmission. The course will cover instrument maintenance, calibration, and the preparation of solids, liquids, and pastes for both reflectance (Universal Attenuated Total Reflectance UATR), and transmission studies. The use of the UATR accessory will be the main focus on day two along with additional techniques for sample preparation.

**Lectures and Labs**

IR theory and advantages of IR spectroscopy
Instrument parts, maintenance and validation
Software operation
Sample preparation using the UATR
Casting films on IR transparent windows
KBr pellet making
Gas cell preparation
Troubleshooting

N020-0152 | 2 Days | Tuition $1,450

**IR Spectral Interpretation for Beginners**

This two-day infrared interpretation course provides students with basic knowledge of the location of absorption bands and the chemical bonds present that are the cause of these absorptions. Various examples of infrared (IR) spectra representing a wide variety of chemical classifications both aliphatic and aromatic will be shown. Each sample spectra discussed will focus on the chemical bonds present and the corresponding infrared absorption. The student will learn the most direct way to interpret an IR spectrum and how to compare an unknown spectrum with known reference spectra. Exercises will focus on a displayed spectrum and the chemical bonds present that cause an infrared absorption in a particular region of the spectrum.

N020-0188 | 2 Days | Tuition $1,450

**AssureID Software**

This two-day workshop includes the use of AssureID software for the collection and evaluation of Mid Infrared and Near Infrared product spectra. Method Explorer, Method Developer, Analysis Setup and Results Browser modules will be demonstrated, and IQ/OQ/PQ setup and System Suitability testing will be covered. Extensive time will be devoted to hands on method development, including spectra processing, workflow choices, and final reports, as well as evaluating and manipulating the model results.
**Thermal Analysis**

N020-0607 | 2 Days | Tuition $1,450

**Introduction to Differential Scanning Calorimetry (DSC 4000, 6000 or 8000, Diamond DSC and Jade)**

This course is for students who have recently started using the DSC 4000, 6000 or 8000, Diamond DSC or Jade instruments. The practical aspects of operation and maintenance as well as introductory theory are covered in the course. In addition, the common functions of the Pyris software and their application to the use of the various power compensated DSC instruments will be demonstrated.

**Prerequisite**
The student should have spent at least one month becoming familiar with the instrument.

**Lectures and Labs**
- System configuration/overview
- Setup
- Baseline optimization
- Calibration
- Maintenance and troubleshooting
- Practical laboratory experiments
- Generic applications
- Data handling
- Operating variables
- Safety

*The Pyris Player and the TGA Autosampler will not be covered in this course.*

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N020-0605 | 2 Days | Tuition $1,450

**Introduction to Thermogravimetric Analysis (TGA 4000, TGA7 and Pyris 1 TGA)**

This course is designed for people who have recently started using TGA 4000, TGA7 and Pyris 1 TGA. The practical aspects of operation and maintenance as well as introductory theory are covered.

In addition, the course covers the common functions of the standard Pyris software and applications of the TGA7 and Pyris 1 TGA.

**Prerequisite**
The student should have spent at least one month becoming familiar with the instrument.

**Lectures and Labs**
- System configuration/overview
- Setup
- Calibration
- Sample handling
- Maintenance and troubleshooting
- Practical laboratory experiments
- Generic applications
- Data handling
- Operating variables
- Safety

*The Pyris Player and the TGA Autosampler will not be covered in this course.*
CUSTOMER CLASSROOM TRAINING PROGRAM - 2019

Training Locations - Life and Analytical Sciences

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta, Georgia</td>
<td>PerkinElmer, Inc. 11695 Johns Creek Parkway</td>
</tr>
<tr>
<td></td>
<td>Johns Creek, GA 30097</td>
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<tr>
<td>Chicago, Illinois</td>
<td>PerkinElmer, Inc. 2651 Warrerville Road</td>
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<tr>
<td></td>
<td>Downers Grove, IL 60515</td>
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<tr>
<td>San Jose, California</td>
<td>PerkinElmer, Inc. 75 Nicholson Lane</td>
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<tr>
<td></td>
<td>San Jose, CA 95134</td>
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<tr>
<td>Shelton, Connecticut</td>
<td>PerkinElmer, Inc. 710 Bridgeport Avenue</td>
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<tr>
<td></td>
<td>Shelton, CT 06484-4794</td>
</tr>
<tr>
<td></td>
<td>Tel: (800) 762-4000 x4</td>
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<tr>
<td></td>
<td>Fax: (203) 944-4902</td>
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<tr>
<td>Toronto, Canada</td>
<td>PerkinElmer, Inc. 501 Rowntree Dairy Road</td>
</tr>
<tr>
<td></td>
<td>Unit 6</td>
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<tr>
<td></td>
<td>Woodbridge, Ontario L4L8H1</td>
</tr>
</tbody>
</table>

Customer Training/How to Enroll

Please mail or fax the completed enrollment form to:

**For Canada/US Enrollment**
PerkinElmer, Inc.
710 Bridgeport Avenue
Shelton, CT 06484
Tel: (800) 762-4000 option 4
Fax: (203) 944-4902
For more information please call (800) 762-4000 x4
(outside US) or fax (203) 944-4902.

**Registration**
Purchase order or credit card payments must accompany the registration. A confirmation email will be sent within 48 hours of receipt of enrollment. If the class you have requested has been filled, a training representative will contact you to advise you of alternate class availability and place you on a waiting list to fill any late cancellations.

To register by phone:
Contact the Training Center (800) 762-4000, option 4 with course request and payment information.

Please carefully review all payment terms and conditions listed below.

Course Agreement/Refund Policy

**Cancellation**
PerkinElmer may cancel or reschedule courses up to 14 days prior to the start date if the minimum enrollment is not met. A full refund of the tuition fee will be provided if this happens. If air travel is required, we discourage the purchase of non-refundable tickets.

PerkinElmer is not responsible for any travel expenses incurred due to a class cancellation. Our refund policy regarding a student’s cancellation from a class is as follows:

- Up to 14 days prior to the course: Full Refund
- Less than 14 days: No Refund (customer may schedule alternate date)

All cancellations must be made with the training administration office directly. For all training inquiries or cancellation, please contact us at (800) 762-4000, option 4.

**Payment**
Pricing is quoted in US Dollars. Payment is required upon enrollment. Purchase order and credit cards accepted. If paying by purchase order, a faxed copy of the purchase order must be provided during course enrollment.

PerkinElmer’s OneSource® laboratory services leverage deep scientific knowledge and expertise in the development of the most comprehensive suite of scientific laboratory services, from instrument maintenance and enterprise solutions to scientific consulting services to optimize laboratory efficiency. Discover our integrated approach and take advantage of an ideal set of tools to help empower your science and drive your business.

For more information, please visit www.PerkinElmer.com/OneSourceTraining

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www.perkinelmer.com

For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs
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# CLASSROOM TRAINING COURSE ENROLLMENT FORM

Email application to: ustraining@perkinelmer.com

PerKinElmer will not guarantee seating without purchase order or credit card for payment. PH: (800) 762-4000, option 4 (US/Canada only) / FAX: (203) 944-4902

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**NAME**

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**PHONE** ____________________________ **FAX** ____________________________ **EMAIL** ____________________________

**COMPANY**

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**ADDRESS**

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**CITY/TOWN** ____________________________ **STATE/COUNTY** ____________________________ **ZIP/POSTAL CODE** ____________________________

**EXPERIENCE WITH PERKINELMER PRODUCTS** ____________________________ **# OF YEARS** ____________________________

**DIETARY REQUIREMENTS**

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*PerkinElmer reserves the right to cancel a course if the minimum requirement is not met. Two (2) weeks minimum notice will be given.

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**METHOD OF PAYMENT:** **Payment must be submitted UPON registration.**

Hard copy purchase orders must be submitted to 203-944-4902 (001 203-944-4902 Europe). PerkinElmer cannot guarantee seating without payment.

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**BILL MY COMPANY USING PURCHASE ORDER NUMBER**

(Copy of purchase order MUST be included with registration in order to guarantee a seat in the class)

________________________ CREDIT CARD (circle one) **MC** **VISA** **AMEX**

Exp.Date: ____________________________ Number: ____________________________

(Credit card information MUST be supplied upon registration).

Name as it appears on card: ____________________________

________________________ TRAINING WAS INCLUDED WITH SALE OF INSTRUMENT

(Please provide PerkinElmer sales order number) ____________________________

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PerkinElmer, Inc.
940 Winter Street
Waltham, MA 02451 USA
P: (800) 762-4000 or (+1) 203-925-4602
www.perkinelmer.com

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For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs

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