Thermo Scientific
LIFECYCLE Education Services
Course Catalog

Training to Help Meet Your Analytical Challenges
Dear Colleague,

Welcome to the 2011 Thermo Scientific LIFECYCLE Education Services Course Catalog. Last year we were still affected by economic uncertainty across all industries. Nevertheless, course attendance remained consistent, and your feedback indicated that training – especially during an economic downturn – is a wise investment for your organization and for you as you progress in your career.

Here’s what you can expect in 2011:

- **Application courses.** With courses ranging from melamine and pesticide detection to protein quantitation, our instructors have developed application-specific courses that make your job easier and make you more productive.

- **Customized training.** Don’t see the specific course you need to take in our catalog? Our instructors will customize a course based on your instrument, technique and timeframe. In fact, we will work closely with you to design a course – taught at your facility or ours!

- **New regional courses.** We will be offering regional training courses at Thermo Fisher facilities around the United States to reduce your travel costs.

- **New e-Learning courses.** Building on the momentum of our self-paced e-Learning online courses in 2010, we have developed additional courses to enhance your knowledge on iCAP Spectral Interferences and NSS Operations to name a few. In addition, we will offer free webinars and webcasts tailored to your unique challenges in the lab. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) for more information as we continue to develop new e-Learning courses throughout the year.

- **State-of-the-art learning facilities across the United States and Canada.** Our modern classrooms provide the ideal setting to maximize your learning experience. Likewise, our laboratories have been redesigned to be more efficient and to accommodate more instruments. By offering a greater breadth and depth of information and instrumentation available, you’ll be sure to get the training and hands-on experience you need, and apply it directly to your process.

Best Regards,

Chuc Gillespie
Scientific Instruments
America’s Technical Services Manager
Operation Training

We teach basic operation theory, proper use, and routine user-level maintenance, including calibration and setup procedures if required for your instruments. Topics span a variety of scientific techniques, from routine analysis and data collection, to research-level triple quad mass spectrometry.

Application Training

Choose from a range of courses focused on the techniques and protocols required for your specific application. We will familiarize you with our systems in detail and teach the skills needed to obtain high-quality data. Our courses emphasize hands-on training to provide students with a wealth of practical experience.

Maintenance Training

Service-level training may be available if you need to be certified on the repair and calibration of our products. These courses can cover troubleshooting tips, technical specifications, and optimization techniques based on similar protocols used to train our engineers.

Software Training

We offer a comprehensive range of courses and workshops covering our entire software product portfolio. From basic instrument software training and instrument integration to data management, our software courses provide the skills you need to get the most from your data.

Customized Training

Our experts will work closely with you to develop a training program to accommodate your specific needs – often incorporating your procedures and using your acquired data. Whether you need to improve a method or develop a more-suitable application, we offer solutions to improve user proficiency and help you achieve optimal performance. Additionally, we continue to develop new courses throughout the year in order to keep up with advances in technology. If you do not see a course in the catalog you feel can meet your needs, please e-mail your inquiry or course suggestion to us.training.analyze@thermofisher.com.

Differentiate yourself in the lab
Training Institute

At multiple locations in North America, our training centers provide environments conducive to learning. Regional courses may be available in additional cities to provide continued flexibility and convenience in planning your professional growth and development. Please visit www.thermoscientific.com/education for classes and locations near you.

On-site Training

For your convenience, all of our courses are available at your facility, using your instrumentation for immediate knowledge transfer. Each course can be customized to meet your individual needs, as one of our industry-expert instructors applies a personal approach to helping you overcome your specific challenge.

Training Facilities

**West Palm Beach, Florida, USA**

Our facility in West Palm Beach is located just miles from some of the most beautiful beaches in the world and is just 20 minutes from Palm Beach International Airport. Driving to the West Palm Beach Training Institute takes approximately one hour from Ft. Lauderdale, two hours from Miami, and three hours from Orlando. The training center offers state-of-the-art laboratories and classrooms, all in a comfortable and professional setting.

**Madison, Wisconsin, USA**

The state capital and home of the world-class University of Wisconsin, Madison consistently ranks as one of the best places to live in America. Driving to the Madison training center takes approximately two hours from Chicago, one hour from Milwaukee, and is served by the nearby Dane County Regional Airport. Our dedicated training classrooms and laboratories are well maintained for an effective learning environment.

*Other North American facilities are located in San Jose, CA; Schaumburg, IL; Somerset, NJ; Billerica, MA; Lanham, MD; Philadelphia, PA and Austin, TX.*
Registration
Please provide payment information when registering. A check, credit card information, or purchase order can be used to ensure enrollment in your selected training course. Course prices are subject to change without notice. Early registration is highly recommended as many courses fill quickly.

Confirmation
Upon registration, students will receive a packet including directions to the scheduled Training Institute, a letter of confirmation, and local hotel information. Travel expenses, such as airfare, are not included in our tuition price.

Weather Related Cancellation
• We reserve the right to cancel any course by 2 pm Eastern time the Friday prior to the course start date.
• We are not responsible for any expenses incurred (for example, non-refundable airline reservations).
• If a customer arrives to the area in advance and the course is cancelled by 2 pm Eastern time the Friday prior to the course start date; we are not responsible for expenses incurred.
• For weather advisories, please contact us at 800-532-4752 and speak directly with the registrar.

Cancellation Policy
• We reserve the right to cancel any course 30 calendar days prior to the scheduled start date, due to insufficient enrollment.
• We reserve the right to change the venue of the course 30 calendar days prior to the scheduled start date.
• Travel arrangements should not be made more than 30 calendar days in advance, as the venue is subject to change.
• In the event of a venue change, you will be notified by a Thermo Fisher Scientific representative.
• We will not be responsible for expenses incurred (for example, non-refundable airline reservations) if the course is cancelled or moved.
• Cost for courses is quoted in U.S. dollars.
• Payment in full is due prior to course attendance.
• Attendee substitutions may be made at any time (call us first to determine if course is appropriate).
• Enrollment in your desired training course(s) is not guaranteed until receipt of this form, the pre-course questionnaire (if applicable), and confirmed method of payment.

Refund Policy
• 100% refund for cancellations received 16+ business days prior to course date.
• 50% refund for cancellations received 10-15 business days prior to course date.
• No refund for cancellations received fewer than 10 business days prior to course date.
• No refund for no-shows.

Contact Us
Training Institute • West Palm Beach, FL • 1 800 532 4752
us.training.analyze@thermofisher.com • www.thermoscientific.com/education
With training and travel budgets being slashed, a physical training course may not be practical for your organization. However, thanks to our self-paced Thermo Scientific e-Learning Courses, you can now receive the quality education you require without ever leaving the comfort of your office or lab. Plus, with e-Learning course prices ranging from $299-$500, you’ll realize immediate cost savings.

Note: Customers will have 30 days to view the course after they’ve activated the course.

**Proteome Discoverer e-Learning Course**  
**1.5 hours**

This course will enable students to become familiar with the latest advances in Thermo Scientific Proteome Discoverer. Students will learn how data obtained from all fragmentation techniques on Thermo Scientific mass spectrometers can be combined and interrogated across multiple search engines to maximize identification and data confidence. Course topics include:

- Learning the components of Proteome Discoverer
- Managing the protein database management
- Searching the database using the Wizard functions
- Building workflow templates
- Curating and interpreting the data
- Quantitating protein

**Recommended:** This course is intended for new operators of Proteome Discoverer. However, prior experience with Thermo Scientific BioWorks 3.0 or higher is helpful. Knowledge of protein/peptide mass spectrometry concepts including ion fragmentation, enzymatic digestion, and liquid chromatography is also recommended.

**OMNIC Software e-Learning Course**  
**4.0 hours**

This course is designed for new users of FT-IR spectrometer systems and Thermo Scientific OMNIC operating software. This course will provide students with a basic understanding of infrared spectroscopy. Course topics include:

- Basic FT-IR theory including how spectrometers work
- How to create Experiment files
- How to create individual user configurations
- Troubleshooting spectral results
- Performing basic post collection data manipulation
- Creating user reference libraries and optimizing library search results

In addition, an FT-IR instrument software-training voucher may be used as full payment for this course.

**NORAN System 7 e-Learning Course**  
**4 hours**

This course is designed for both new and experienced Thermo Scientific NORAN System 7 users. The complete course divides into eight modules, which emphasize the operation of NORAN System 7 software. Each module is complete within itself. Course topics include:

- Theoretical aspects of microanalysis
- Projects and software overview
- Spectrum mode
- Advanced spectral processing
- Electron imaging and Point & Shoot
- Spectral Imaging
- Compass and X-phase
- X-ray Linescan

**iCAP Spectral Interferences e-Learning Course**  
**1.5 hours**

This course guides the student through three narrated interactive modules. A learner friendly progression of information will begin with defining what spectral interference is and why it occurs; followed by identification and correction concepts. The course explores two types of interference thoroughly: Baseline Shifting and Direct Spectral Overlap. Throughout this exploration, the student experiences tools available in iTeva facilitating the identification of this interference and the respective correction techniques available to overcome it. Real data are used to illustrate examples of Spectral Interference. Animated iTeva software manipulation displays the necessary steps to combat this common interference. A learner comprehension demonstration follows each module, and responds to course related multiple-choice questions. Course topics include:

- Defining Spectral Interference
- Identifying the presence of Spectral Interference
- Baseline Shifting
  - Viewing image data
  - Background Correction Point function and purpose
  - Proper positioning of Background Correction Points
- Direct Spectral Overlap
  - Interfering Element Correction (IEC) function and purpose
  - Manual IEC Calculation
  - Automated IEC Calculation
Our Molecular Spectroscopy training courses offer both practical and theoretical training and are taught by experienced and certified instructors. Course sizes are kept to a minimum to ensure each student has access to instruments, as well as time to address his specific topics of interest. In addition, customers are encouraged to bring samples (including MSDS sheets) to instrument operations courses.

Note: Courses are taught using the latest version of the instrument and software and may not reflect the instruments or software you currently use.
DISPERSONE Raman Operations

DXR Micro Raman Operations

3 days

This course is designed to help users get the most from their Thermo Scientific DXR Raman instrument and will educate users on system configuration and software through lecture and hands-on training. In addition to providing students a sound understanding of Raman theory, the course also features instruction on proper experiment setup, alignment, and use of tools and software. Training will also cover post-collection data manipulation, sample preparation, and the use of system tools. Course topics may include:

- Raman theory
- Experiment setup and configuration
- System alignment
- Creation and use of libraries
- Mapping using Thermo Scientific Altus software (microscope with automation only)

Note: This course does not cover operation of the Thermo Scientific DXR SmartRaman. Please contact us for on-site training information related to the DXR SmartRaman.

Nicolet Almega XR Raman Spectroscopy Operations

3 days

On-site only, please contact us for additional details

This course is designed to help users get the most from their Thermo Scientific Almega XR, and will educate users on system configuration and software through lecture and hands-on training. In addition to providing students a sound understanding of Raman theory, the course also features instruction on proper experiment setup, alignment, and use of tools and software. Course topics include:

- Raman theory
- Experiment setup and configuration
- System alignment
- Creation and use of libraries
- Mapping using Altus™ software

Recommended: Students are encouraged to bring samples for analysis as the course covers post-collection data manipulation, sample preparation, and the use of system tools.

An FT-IR instrument software-training voucher may be used as partial payment for this on-site training course.

FT-IR OPERATIONS

FT-IR Sampling Techniques

4 days

This course is designed for laboratory personnel who use infrared analysis as a tool in the identification and quantification of materials. Different sample handling accessories employ for different types of analysis. This course is intended to help the attendees get the most out of these basic sampling accessories, understanding the strengths and drawbacks of the various approaches available. Course topics include:

- Basic infrared absorption theory
- Learning to read a spectrum
- Theory of FT-IR
- Sample handling
- Transmission experiments
- Reflection experiments
- Data collection

Prerequisites: Students should be knowledgeable with the use and function of their FT-IR OMNIC™ software. This course will cover the operation software as it pertains to the data collection techniques presented.

Fundamentals of FT-IR Analysis Operations

4.5 days

This course is designed to provide all the tools necessary for the user who would like to expand their knowledge of analysis with FT-IR spectrometers. The course material is presented as a combination of software training, instrumental demonstrations, and hands-on activities through the use of desktop computers and instruments in a laboratory setting. Course topics include:

- Basic FT-IR theory
- Creating Experiment files
- Creating user configurations
- Transmission Analysis with FT-IR
- Attenuated Total Reflectance (ATR) theory and data collection
- Reflection Analysis using sampling accessories
- Post-collection data manipulation
- Creating custom user reports
- Creating user libraries and optimizing library search results
- An introduction to spectral interpretation

An FT-IR instrument software-training voucher may be used as partial payment for this course.
MICROSCOPE OPERATIONS

Nicolet Continuum Microscope Operations
4 days

This course is designed to provide users with detailed knowledge for the analysis of a wide range of samples using various microscopy techniques. Sample preparation and optimization of hardware settings on the microscope will be emphasized. The course utilizes a combined approach of lecture, demonstration, and hands-on training to show the user how to exploit the powerful advantages of the Thermo Scientific Nicolet Continuum microscope. Students are encouraged to bring relevant samples to the course for analysis. Course topics include:

- Basic FT-IR theory
- Introduction to Microscopy
- Microscope alignment and performance testing
- Sample preparation techniques for transmission and reflection analysis
- Attenuated Total Reflectance (ATR) theory and analysis
- Creation of user libraries and optimizing library search results
- Sample mapping using Atlas software

Prerequisite: Students should be familiar with Thermo Scientific OMNIC FT-IR software. Discussions include portions of the software specific to microscopy only.

A Continuum Microscope Operations training voucher may be used as partial payment for this course.

Nicolet iN10/iN10 MX Microscope Operations
3 days

This course is designed to provide the user with detailed knowledge for the analysis of a wide range of samples using various microscopy techniques, and will emphasize sample preparation and optimization of hardware settings on the microscope. The course utilizes a combined approach of lecture, demonstration, and hands-on training to show the user how to exploit the powerful advantages of the Thermo Scientific iN10/iN10 MX microscope and Picta software. Students are encouraged to bring relevant samples to the course for analysis. Course topics include:

- Basic FT-IR theory
- Introduction to Microscopy
- Microscope alignment and performance testing
- Sample preparation techniques for transmission and reflection analysis
- Attenuated Total Reflectance (ATR) theory and analysis
- Creation of user libraries and optimizing library search results
- Sample mapping and analysis using Picta software

Prerequisites: Students should be familiar with Thermo Scientific OMNIC FT-IR software. Discussions include portions of the software specific to microscopy only.

A Nicolet™ iN™ 10 or iN10 MX Microscope Operations training voucher may be used as partial payment for this course.

FT-RAMAN OPERATIONS

Nicolet NXR FT-Raman Spectroscopy Operations
3 days

This course is designed for users who are new to FT-Raman as an analysis technique or for those who wish to optimize instrument and software settings for the best possible results. The use of different sampling accessories and different software packages are covered during the course. A combination of lecture and hands-on sampling will demonstrate the effectiveness of Raman as an analysis technique. Course topics include:

- Basic Raman theory
- Instrumental and accessory description
- Sampling considerations and optimization
- Use of MicroStage and Array Automation for analysis
- Experiment setup
- User configuration files
- Basic post-collection data manipulation
- Creation of user libraries and optimization of library searches
- Use of Thermo Scientific Atlas and Array Automation for data collection

An FT-IR instrument software-training voucher may be used as partial payment for this course.

On-site Training is Available
For your convenience, all courses are available at your facility, and can be customized to suit your specific application. Contact us for details!

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us.training.analyze@thermofisher.com
www.thermoscientific.com/education

For a schedule of course dates and locations visit: www.thermoscientific.com/education
SOFTWARE AND APPLICATIONS

OMNIC Software Operations
3 days

This course is designed for advanced users and those who wish to utilize the capabilities of the system beyond basic data collection with their Thermo Scientific OMNIC system software. This course utilizes desktop computers and examples to provide hands-on use of the tools discussed during the course. Course topics include:

• Basic FT-IR theory including how spectrometers work
• How to create Experiment files
• How to create individual user configurations
• Troubleshooting spectral results
• Performing basic post collection data manipulation
• Creating user reference libraries and optimizing library search results
• Creating custom reports and storing them within OMNIC
• Advanced data processing

Recommended: Students are encouraged to bring automation challenges and spectra to the course for real-world examples.

A Nicolet 6700 or 8700 instrument or software voucher may be used as full payment for this course.

Basic Macro Development
1 day

As an addition to the Thermo Scientific OMNIC Software Operations course, this course covers automation of sample collection and processing using the optional MACROS Basic software package. This is an interactive class that details how to create automated basic procedures and then combine those together to create more detailed experimental procedures to solve problems and assure precision in the results obtained. Learn how to:

• Save time on repetitive manipulations
• Automate difficult tasks
• Enhance productivity in new analysts
• Improve consistency in analytical procedures

Visit www.thermoscientific.com/education to learn more about this course.

Prerequisites: Familiarity with OMNIC software; Need to solve problems.

Quantitative TQ Analyst Software Operations
3 days

This course is designed to enhance users’ understanding of Thermo Scientific TQ Analyst software as a tool for quantitative analysis method development. An overview of chemometric analysis methods and experimental design principles is included. This course utilizes an array of data sets to demonstrate the different types of models available to the user. Students utilize desktop computers for this course to work along with the instructor on example methods and then perform a series of increasingly complex exercises to gain hands-on experience with the software and method creation. Course topics include:

• Development of models based on
  – Simple Beer’s law
  – Classical least squares (CLS)
  – Partial least squares (PLS)
  – Classification analysis
• Quantitative method diagnostics
• Software wizards to measure the feasibility and performance of the methods

Recommended: In addition to the prepared data sets, students are encouraged to bring data sets of spectra from analytical approaches they wish to create.

Prerequisites: Students must have a familiarity with Thermo Scientific OMNIC software.

An FT-IR instrument software-training voucher may be used as partial payment for this course.

Spectral Interpretation Applications
4.5 Days

This course is designed for people who desire an extensive review of the interpretation of mid-infrared spectra. It is designed to show students how to interpret FT-IR spectra for structural information. The course is presented in a lecture/workshop format where the students will have an opportunity to interpret data and to present their findings to the class. Course topics include:

• Alkanes and branched alkanes
• Alkenes and alkynes
• Aromatics
• Carbon containing alkyl groups
• Ethers and alcohols
• Amines, amides, and nitro compounds
• Halides
• Polymers
• Inorganics
• The use of interpretive aids

An FT-IR instrument software-training voucher may be used as partial payment for this course.
FT-IR Gas Analysis Operations

On-site only, please contact us for additional details

This course is designed for analysts who use infrared spectroscopy for the quantitative analysis gas phase samples. This may include the use of a FT-IR system with a gas cell or the use of the Thermo Scientific Antaris IGS gas analyzer. Depending on hardware configuration and applications, the course topics may include:

• FT-IR theory of gases
• Optimizing collection parameters for spectral acquisition
• Thermo Scientific SERIES software for the monitoring of gas evolution or process streams
• Gas applications and sample considerations
• Antaris™ IGS system hardware overview
• Quantitative analysis using the CLS functions of the TQ Analyst™ software
• Correcting for spectral interferences and non-linear response
• Thermo Scientific RESULT Integration software to develop workflows
• Thermo Scientific RESULT Operation software for run-time operations

Prerequisite: Students should be familiar with basic Windows® operations.

An FT-IR instrument software-training voucher may be used as partial payment for on-site training.

Nicolet ECO FT-IR Metrology Tool Applications

On-site only, please contact us for additional information

This course is designed for engineers who are responsible for creating analysis methods in the clean room. The information presented during training provides a comprehensive knowledge of FT-IR principles and how they apply to process monitoring of semi-conductor wafers. Detailed application discussions are also highlighted in regard to dielectric films analysis, epitaxial film thickness and impurity determinations in silicon wafers. Course topics may include:

• Theory of Infrared Spectroscopy
• Use of Thermo Scientific ECO software for routine process monitoring
• Customizing ECO™ software
• Monitoring system performance
• Creating custom methods with ECO software
• Using ECO research software to solve problems
• Theory of quantitative analysis
• Using TQ Analyst software to create calibration models
• Diagnostic determination of calibration model robustness

Note: Operators and maintenance personnel may also gain helpful knowledge; however the course is intended to exceed routine analysis and does not cover hardware maintenance.

An FT-IR instrument software-training voucher may be used as partial payment for the on-site training.
Designed to offer both practical and theoretical training, the Mass Spectrometry and Chromatography courses are taught by experienced and certified instructors. Course sizes are kept to a minimum to ensure each student has access to instruments, as well as time to address their specific topics of interest.

Note: Courses are taught using the latest version of the instrument and software and may not reflect the instruments or software you currently use.
**MASS SPECTROMETRY OPERATIONS**

### LCQ Operations

**4 days**

This course is designed for users new to the Thermo Scientific LCQ and covers mass spectrometry and chromatography in general, with emphasis on small molecule applications. The course involves lecture material, software training and hands-on sessions that involve tuning, calibration, and comprehensive LC/MS method development using both electrospray and atmospheric pressure chemical ionization.

A detailed training manual and a CD containing all data acquired during the course are included, along with additional course materials. Course topics include:

- Ion trap theory
- Tuning and calibration
- Hands-on APCI and ESI MS
- Instrument method development for LC/MS
- Multi-stage MS’ method building
- Quantitative analysis
- Thermo Scientific Xcalibur software
- Basic maintenance

### LCQ Biotech Operations

**4 days**

This course is for users who perform peptide and protein analysis with their Thermo Scientific LTQ mass spectrometer using the current version of Thermo Scientific Xcalibur software. Students will perform hands-on experiments including tuning, data acquisition and interpretation utilizing nanospray ionization. Course size is limited in order to maximize hands-on experience. Course topics include:

- Ion trap theory
- Tuning and calibration
- Hands-on ESI and NSI MS
- Instrument method development for nano LC/MS
- Data Dependent™ method design
- Post-translational modification methods
- Xcalibur® software for qualitative methods
- Proteome Discoverer software training
- Basic maintenance

**Prerequisite:** It is strongly recommended students complete the Thermo Scientific LTQ Operations course, or have extensive experience using an LTQ™ mass spectrometer and Xcalibur software.

### LTQ Family Operations

**4 days**

This course is designed for users new to the Thermo Scientific LTQ mass spectrometer and covers mass spectrometry and chromatography in general, with emphasis on small molecule applications. The course includes lecture material, software training and intense hands-on sessions involving tuning, calibration, and comprehensive LC/MS method development using both electrospray and atmospheric pressure chemical ionization.

A detailed training manual and a CD containing all data acquired during the training course are included, along with additional course materials. Course topics include:

- Ion trap theory
- Tuning and calibration
- Hands-on APCI and ESI MS
- Instrument method development for LC/MS
- Multi-stage MS’ method building
- Quantitative analysis
- Xcalibur software
- Basic Thermo Scientific LTQ maintenance

### LTQ Family Biotech Operations

**4 days**

This course focuses on electrospray ionization (ESI) of proteins and peptides, tuning using nanospray, and Data Dependent acquisition. Additionally, the course provides in-depth discussion and hands-on learning of qualitative analysis using the latest version of Thermo Scientific Xcalibur and Thermo Scientific Proteome Discoverer software. The course will also provide students with a detailed training manual, a CD containing data acquired during the course and additional course materials. Course topics include:

- Ion trap theory
- Tuning and calibration
- Hands-on APCI and ESI MS
- Instrument method development for LC/MS
- Data Dependent method design
- Post-translational modification methods
- Xcalibur software for qualitative methods
- Proteome Discoverer software training
- Basic Thermo Scientific LTQ maintenance

**Prerequisite:** Practical LC/MS for Beginners course or previous experience developing LC/MS methods.

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For a schedule of course dates and locations visit: [www.thermoscientific.com/education](http://www.thermoscientific.com/education)
LTQ Orbitrap Operations
4 days

This course is intended for new users to the Thermo Scientific Orbitrap system. This course covers the fundamentals of mass spectrometry, with emphasis on small molecule accurate mass applications. Users will gain hands-on experience using both ESI and APCI ionization techniques and learn the benefits of accurate mass detection. Course topics include:

- Ion trap theory
- Orbitrap™ theory
- Tuning and calibration
- Hands-on APCI and ESI MS
- Instrument method development for LC/FTMS
- Multi-stage MS® method building
- Parallel detection methods
- Accurate mass methods
- Thermo Scientific Xcalibur software
- Basic Thermo Scientific LTQ maintenance

LTQ Orbitrap Biotech Operations
4 days

This course is designed for the experienced LC/MS users and will give students a comprehensive understanding of electrospray ionization (ESI) of proteins and peptides, tuning using nanospray, and optimization of Data Dependent acquisition. Lectures will provide in-depth discussion of qualitative analysis, while hands-on software training (using the latest Thermo Scientific Xcalibur and Proteome Discoverer software applications) will show students how to process accurate mass methods and create data sets.

A detailed training manual and a CD containing data acquired during the course are included, along with additional course materials. Course topics include:

- Ion trap theory
- ETD theory
- Tuning and calibration
- Hands-on ESI and NSI MS training
- Instrument method development for nano LC/MS
- Data Dependent method design using ETD and CID
- PTM methods
- Xcalibur software for qualitative methods
- Proteome Discoverer software
- Basic LTQ and ETD maintenance

Prerequisite: Thermo Scientific LTQ XL Operations, or extensive experience using the LTQ XL mass spectrometer and Xcalibur software.

Note: Students seeking detailed instruction of small molecule analysis and qualitative/quantitative data processing should attend the Thermo Scientific LTQ XL Operations course. Students seeking detailed instructions of protein and peptide analysis who do not have access to ETD in their own laboratories should attend the Thermo Scientific LTQ XL Biotech Operations course. Students who desire Xcalibur software training should attend the Thermo Scientific Xcalibur Software Operations course.

LTQ Family with ETD Operations
4 days

This course is designed for experienced LC/MS users who performs protein analysis using the Thermo Scientific LTQ mass spectrometer equipped with an electron transfer dissociation (ETD) source. Students are introduced to the use of ETD as an alternative to collision induced dissociation (CID) typically associated with the structural analysis of proteins and peptides, and the identification of post-translational modifications (PTMs). The course will also cover electrospray ionization (ESI) of protein and peptides, tuning using nanospray, and optimization of Data Dependent acquisition. The curriculum will feature lectures, in-depth discussions of qualitative analysis, and hands-on training using the latest versions of Thermo Scientific Xcalibur and Proteome Discoverer software.

A detailed training manual and a CD containing data acquired during the course are included, along with additional course materials. Course topics include:

- Ion trap theory
- ETD theory
- Tuning and calibration
- Hands-on ESI and NSI MS
- Instrument method development for nano LC/MS
- Data Dependent method design using ETD and CID
- PTM methods
- Xcalibur software for qualitative methods
- Proteome Discoverer software
- Basic LTQ and ETD maintenance

Prerequisite: Thermo Scientific LTQ XL Operations course or previous experience developing LC/MS methods.

Note: Students seeking detailed instruction of small molecule analysis and qualitative/quantitative data processing should attend the Thermo Scientific LTQ Orbitrap Operations course (page 14).

Students who desire Xcalibur software training should attend the Thermo Scientific Xcalibur Software Operations course (page 21).
MALDI LTQ XL Operations

4 days
On-site only, please contact us for additional details

This course is an alternative to the electrospray ionization method (ESI), and will introduce experienced Thermo Scientific LTQ XL operators to the matrix-assisted laser desorption ionization (Thermo Scientific MALDI) method for the structural analysis of peptides and the identification of post-translational modifications (PTM). In addition, the course will cover basic sample preparation methods for MALDI™ analysis of peptides, instrument tuning and calibration, optimization of Data Dependent acquisition methods and instrument maintenance. The curriculum will feature lectures, in-depth discussions of qualitative analysis, and hands-on training using the latest versions of Thermo Scientific Xcalibur and Proteome Discoverer software. Course includes a detailed training manual and a CD containing data acquired during the course, in addition to other course materials. Course topics include:

• Ion trap theory
• MALDI theory
• Tuning and calibration
• Sample preparation for MALDI MS
• Instrument method development for MALDI MS
• Data Dependent method design
• PTM methods
• Xcalibur software for qualitative methods
• Proteome Discoverer software overview
• Basic LTQ XL and vMALDI maintenance

Prerequisite: Previous experience with Thermo Scientific MALDI-TOF and/or Ion trap mass spectrometry.

Note: Students seeking detailed instruction of small molecule analysis and qualitative/quantitative data processing should attend the Thermo Scientific LTQ Operations course (page 13). Students seeking detailed instructions of protein and peptide analysis using ESI-LC/MS or nano-LC/MS should attend the Thermo Scientific LTQ Biotech Operations course (page 13). Students who desire Xcalibur software training should attend the Thermo Scientific Xcalibur Software Operations course (page 21).

LTQ FT Ultra Operations

4 days
On-site only, please contact us for additional details

This course is for new users to the Thermo Scientific LTQ FT system, and covers mass spectrometry in general, with an emphasis on small molecule accurate mass applications. Users will gain experience using both ESI and APCI ionization techniques, and learn the benefits of accurate mass detection. The IRMPD technique will also be covered if required by students. Course topics include:

• Ion trap theory
• FT theory
• Tuning and calibration
• Hands-on APCI and ESI MS
• Instrument method development for LC/FTMS
• Multi-stage MS' method building
• Parallel detection methods
• Accurate mass methods
• Xcalibur software
• Basic LTQ maintenance
• IRMPD technique (as needed)

On-site Training is Available

For your convenience, all courses are available at your facility, and can be customized to suit your specific application. Contact us for details!

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LTQ FT Ultra Biotech Operations

4 days

On-site only, please contact us for additional details

This course is intended for users of the Thermo Scientific LTQ FT Ultra who perform peptide and protein analysis using the latest version Thermo Scientific Xcalibur software, and who are already familiar with instrument method setup. Students will engage in hands-on experiments including tuning, data acquisition, and interpretation utilizing nanospray ionization. Course size is limited to maximize hands-on experience.

Course topics include:
• Ion trap theory
• FTMS Theory
• Tuning and Calibration
• Hands-on ESI and NSI MS
• Instrument Method Development for LC/FTMS
• Nano-flow LC Method Development
• Data Dependent Method Design
• Post Translational Modification Methods
• Parallel Detection Methods
• Accurate Mass Methods
• Xcalibur Software for Qualitative Methods
• Proteome Discoverer Software
• Basic Thermo Scientific LTQ Maintenance

Prerequisite: Thermo Scientific LTQ FT Ultra Operations, or extensive experience using Xcalibur software and the Thermo Scientific LTQ XL FT instrument.

MSQ Plus (Surveyor) Operations

3 days

This course will familiarize new Thermo Scientific MSQ Plus (Surveyor) users with basic instrument operation, including API and mass spectrometry theory. The course will also cover compound, optimization, calibration of the instrument, data collection and user-level maintenance. The Thermo Scientific Xcalibur software package will be thoroughly explored. Students will gain hands-on experience and become familiar with the MSQ™ Plus (Surveyor) instrument by exploring the following topics:
• LC/MS operational methodology
• Overview of quadrupole instrumentation
• Introduction to MS theory
• API techniques
• Hardware components specific to the MSQ Plus (Surveyor)
• Method development
• Calibration and data acquisition
• Compound optimization

Prerequisites: Students should have a general understanding of mass spectrometry, gas chromatography and Windows software.

DSQ/DSQ II (with TRACE GC Ultra) Operations

4 days

This course will allow users to gain a complete understanding of the operation and maintenance of Thermo Scientific products, including the TRACE GC Ultra oven, DSQ™/DSQ II mass spectrometer, and Xcalibur software. Course consists of lectures along with laboratory experiments where participants will create qualitative and quantitative analysis, processing methods, and reports. Lectures and course notes will be provided for both instrument and software lessons. Course topics include:
• Setup and maintenance of the DSQ™/DSQ II, TRACE GC Ultra
• Setup and maintenance of the AS3000 and TriPlus™ autosamplers
• Xcalibur processing methods (qualitative and quantitative analysis)
• Merlin reports
• User libraries
• Chemical ionization
• Probe analysis

Prerequisites: Students should have a general understanding of mass spectrometry, gas chromatography and Windows software.

PolarisQ/ITQ (with TRACE GC Ultra) Operations

4 days

This course teaches basic operation of Thermo Scientific products including the TRACE GC Ultra oven, PolarisQ mass spectrometer, and Xcalibur software. Lectures and hands-on experiments further enhance the learning experience. Course topics include:
• TRACE GC Ultra™ oven maintenance and setup
• Set up of AS3000 and Thermo Scientific TriPlus autosamplers
• Xcalibur software analysis and processing methods (qualitative and quantitative)
• Merlin reports
• User libraries
• Special topics – MS/MS
• Chemical ionization
• Probe analysis

Prerequisites: Students should have a general understanding of mass spectrometry, gas chromatography and Windows software.
Aria System User Training

4 days

This introductory course is designed for users who are new to Thermo Scientific products including the Aria and Transcend systems using our TurboFlow technology to minimize sample preparation. Through lectures, demonstrations, and hands-on practice with both instrument and software, students become proficient in the following areas:

• Functions of system hardware components and theory of TurboFlow technology
• Entering method information into Aria™ OS
• Creating batches, starting a run and monitoring runs
• Changing Aria software settings to optimize system performance to individual laboratory needs
• Maintaining the system according to Thermo Fisher recommendations
• Performing basic troubleshooting techniques

TSQ Family Operations

4 days

This course will familiarize the new Thermo Scientific TSQ user with the fundamentals of basic instrument operation (Ultra or Access). Hands-on experimentation will cover both ESI and APCI techniques, with an emphasis on quantitative methods (e.g., SRM methods). Qualitative data review using Thermo Scientific Xcalibur software is also covered, with the emphasis on running Thermo Scientific LCQUAN Software.

Course topics include:

• Fundamentals of Mass Spectrometry
• TSQ™ hardware
• TSQ scan modes
• TSQ instrument control
• Xcalibur
• LCQUAN
• XReport™
• User maintenance

TurboFlow System or FAIMS Source Option: For customers who use the Aria system, instructors expand the Thermo Scientific TSQ Quantum Operations course to include in-depth training related to these accessories, as it relates to your complete system analyses. Due to system limitations, this expanded course is available at the customer site only. Please indicate your course preference at time of pre-registration.

TSQ Accurate Mass Operations

3 days

On-site only, please contact us for additional details

This course will familiarize the Thermo Scientific TSQ Accurate Mass user with detailed operational procedures required for the acquisition of accurate mass data. Nominal/High-resolution/Accurate Mass tuning and calibration and data collection will be covered. The course will be presented in a lecture/workshop format where the students will have an opportunity to collect, interpret and present their data findings to the class. Course topics will cover:

• Accurate mass measurement introduction
• Important points for accurate mass operation
• Instrument calibration
• Lock masses
• Examples of accurate mass data from the instrument
• Data acquisition through Tune Page and Thermo Scientific Xcalibur
• Xcalibur processing of accurate mass data

Prerequisites: Intermediate- to advanced-level chromatography skills with prior exposure to accurate mass procedures. Plus, an in-depth understanding of organic chemistry principles is helpful.

GC Quantum Operations

4 days

On-site only, please contact us for additional details

This course will help you gain a complete understanding of the operation and maintenance of the Thermo Scientific TRACE GC Ultra and the GC Quantum mass spectrometer, plus working knowledge of Thermo Scientific Xcalibur software. Emphasis is given to quantitative methods using SRM and HSRM. Course consists of lectures along with laboratory experiments where participants will create qualitative and quantitative analysis processing methods and reports. Hardcopy of the training manual will be provided. Course topics include:

• Setup and maintenance of the TRACE GC Ultra
• Fundamentals and instrumentation of the Thermo Scientific GC Quantum
• Scan modes
• GC Quantum tuning
• Xcalibur software
• XReport
• User libraries
• Chemical ionization
• Probe analysis
• GC Quantum maintenance

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For a schedule of course dates and locations visit: www.thermoscientific.com/education
**Exactive Operations Course**

**3 days**

This course is designed to familiarize the new Thermo Scientific Exactive user with detailed operation of the complete system including LC/MS hardware, Thermo Scientific Xcalibur software and layered applications, as well as recommended preventative maintenance and troubleshooting procedures. Course time is split between classroom lecture and laboratory sessions where the student conducts pre-determined experiments designed to reinforce key concepts and information provided. Course topics include:

- LC/MS considerations
- Short review of the theory and practical operation of the Thermo Scientific Orbitrap mass analyzer
- System tuning and calibration procedures
- Preventative maintenance and troubleshooting procedures (ex. cleaning the stack)
- Explanation of Orbitrap scanning modes
- Optimizing an instrumental method
- Sequence setup
- Data review and analysis via Qual Browser

*Recommended:* New Exactive operators but preferably with prior experience on Thermo Scientific Finnigan mass spectrometers and fundamental knowledge of mass spectrometry, liquid chromatography, and Xcalibur software; operators intending to utilize the system for the analysis of small molecules is also recommended.

*Note:* If the content of this course is not exactly in line with your needs, a custom course can be developed for up to four operators (per installed system) and delivered at your facility for an additional fee.

**Protein Quantitation**

**4 days**

This new course will familiarize mass spectrometry users with targeted protein quantitation and how to discover proteins changing levels in a complex sample using ion trap technology and database searching (e.g. Thermo Scientific Proteome Discoverer). Students will also learn how to use our Pinpoint software to develop methods to perform targeted quantitation using triple quadrupoles. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.

**ISQ (With TRACE GC Ultra) Operations**

**4 days**

This course will familiarize users with operating and maintaining the Thermo Scientific ISQ Single Quadrupole Mass Spectrometer, the TRACE GC Ultra gas chromatograph, and the Xcalibur software. The course consists of lectures along with laboratory exercises to reinforce the learned material. Students will learn how to tune and calibrate the mass spectrometer for optimal performance. In addition, students will create qualitative and quantitative analysis, processing methods and reports. Lectures and course notes will be provided for both instrument and software lessons. Course topics include:

- Setup and maintenance of the ISQ™, TRACE GC Ultra
- Tuning of the ISQ mass spectrometer
- Setup and maintenance of the Triplus, or AS3000 autosampler
- Xcalibur processing methods (Qualitative and Quantitative analysis)
- Xreport Template maker
- User Libraries
- Chemical Ionization
- Probe Analysis

*Prerequisites:* Students should have a general understanding of mass spectrometry, gas chromatography and Windows software.

**Pesticide Detection in Food by LC-MS/MS**

**3 days**

This new course is designed to familiarize users with the analytical methodology for sample preparation and quantitative analysis of pesticides in food products by LC-MS/MS. Topics in this class include background and trends in pesticide analysis, current regulatory requirements, method setup and 21 CFR Part 11 compliance. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.

**Pesticide Detection in Food by GC-MS**

**3 days**

This new course is designed to familiarize users with basic workflow of the QuEChERS methodology for extractions of pesticides in food and operations of the Thermo Scientific TRACE GC Ultra oven operation, TSQ Quantum mass spectrometer, and Xcalibur software. Topics in this class include TSQ Quantum tuning and optimization, instrument setup and user libraries. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.
**CHROMATOGRAPHY INSTRUMENT OPERATIONS**

**GC and GC/MS Sample Preparation for Solid Phase Microextraction**

*2 days*

This new course is designed for users who want comprehensive knowledge of sample preparation techniques used in gas chromatography using the Solid Phase Microextraction (SPME) sample preparation technique. The course is mostly hands-on and the techniques are reinforced by live experiments using a Thermo Scientific GC/MS instrument equipped with our TriPlus autosampler in the SPME mode. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.

**GC and GC/MS Sample Preparation for Static Headspace**

*2 days*

This new course is designed for users who want comprehensive knowledge of advanced injection techniques used in gas chromatography through the Static Headspace sample preparation technique. The course is mostly hands-on and the techniques are reinforced by live quantitative experiments using a Thermo Scientific TRACE DSQ II GC/MS instrument equipped with our TriPlus Headspace autosampler. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.

**Melamine and Cyanuric Acid Detection in Food Products by LC-MS/MS**

*3 days*

This new course is designed to familiarize users with the analytical methodology involved in the detection and determination of melamine and cyanuric acid in food products by LC-MS/MS. Topics in this course include background and current food safety issues, regulatory requirements, and 21 CFR Part 11 compliance. Visit [www.thermoscientific.com/education](http://www.thermoscientific.com/education) to learn more about this course.

**Accela UHPLC Training**

*3 days*

This course is designed for users who are new to the Thermo Scientific Accela UHPLC System. Through lectures and hands-on lab experience, students will gain an understanding of the method development process related to liquid chromatography for standard and high-pressure separations. Course topics include:

- UHPLC theory and stationary phase design
- The various modes of chromatographic separation (i.e., Reversed Phase, Normal Phase, etc.)
- Developing robust methods for high-pressure separations
- Mobile phase selection
- Troubleshooting separations

**Basic HPLC Training Operations**

*2 days*

This course is designed for users new to high performance liquid chromatography as both a qualitative and quantitative means of analysis. Through lectures and hands-on lab experience, students will gain an understanding of the method development process related to liquid chromatography. Course topics include:

- HPLC theory and stationary phase design
- The various modes of chromatographic separation (i.e., reversed phase, normal phase, etc.)
- Developing robust methods
- Mobile phase selection
- Troubleshooting separations

**HPLC Method Development for LC/MS Operations**

*3 days*

This course is designed to introduce users to the fundamental principles of high performance liquid chromatography, with an emphasis on mass spectrometry as a means of detection. The course will cover the theory of separation and detection for both Thermo Scientific LC/UV and LC/MS systems, as well as method development strategies for robust LC/MS methods. Hands-on experience with this instrumentation enhances the learning process. Course topics include:

- HPLC theory
- MS theory (both quadrupole and ion trap)
- Mobile phase considerations for UV and MS detection
- Choosing the proper stationary phase
- Troubleshooting separations

For a schedule of course dates and locations visit: [www.thermoscientific.com/education](http://www.thermoscientific.com/education)
Basic Gas Chromatography

2 days

This course is designed for users new to chromatography and will teach the key fundamentals of gas chromatography, and how to incorporate hands-on experiments with real samples. Course topics include:

• Gas chromatography setup and requirements
• GC components: Inlets (Split/Splitless, PTV, COC), Detectors (FID, TCD, NPD, ECD, FPD), Injectors (manual injection) and column technology
• Running the instrument (Data collection and viewing)
• Chromatography theory (Plate theory, chromatographic resolution)
• Qualitative and quantitative analysis using GC

Gas Chromatography Method Development

3 days

This course is designed to heighten GC and GC/MS users’ understanding of gas chromatography separations with emphasis in method development. Students will learn carrier gas types, which injection technique to use, and how to set it up. Also, students will learn about the different types of capillary columns used and when to use isothermal or temperature programming conditions for their chromatography instrument. The course will also cover the most common different detectors available for GC. As part of the course, students will perform laboratory exercises for enhanced learning in method development GC. At the conclusion of the course, students will know the following:

• GC theory
• Injection techniques
• Capillary columns
• Detectors
• Method development
• Qualitative and quantitative analysis
• Troubleshooting

SOFTWARE OPERATIONS

Proteome Discoverer Operations

2 days

This course will familiarize students with the latest advances in Thermo Scientific Proteome Discoverer. Users will learn how data obtained from all fragmentation techniques on Thermo Scientific mass spectrometers can be combined and interrogated across multiple search engines to maximize identification and data confidence. The course time will be focused on instruction and hands-on time with the software. Course topics include:

• The components of Proteome Discoverer
• Protein database management
• Database searching using the Wizard functions
• Building workflow templates
• Data curation and data interpretation
• Protein quantitation

Recommended: This course is intended for new operators of Proteome Discoverer, but prior experience with Thermo Scientific BioWorks 3.0 or higher would be of great value. Knowledge of protein/peptide mass spectrometry concepts including ion fragmentation, enzymatic digestion, and liquid chromatography is required.

ChromQuest Software Module – HPLC Systems

2.5 days

This course will educate students on each function of Thermo Scientific ChromQuest software in order to perform qualitative and quantitative analysis of LC detector data. Course topics include:

• Complete instrument setup
• Surveyor Stacks (LC/MS Pump, AS, PDA), TSP products (AS3000, P4000, UV3000, etc.)
• ChromQuest™ system overview and configuration
• Data collection and viewing
• Naming/labeling peaks and groups
• Integration events (for reliable peak identification)
• Calibration curves
• Sequences and data analysis
• Reporting
ChromQuest Software Module – GC

3 days
This hands-on course uses real samples to familiarize users with the operation of Thermo Scientific ChromQuest software for use in qualitative and quantitative analysis of GC detector data. Course topics include:
• ChromQuest system configuration
• Instrument setup
• Instrument usage
• Peak/Group tables
• Integration events
• Calibration curves
• Sequences
• Reporting

Envirolab (ELF) Software Operations

4 days
This course will educate students on the latest version of Thermo Scientific Envirolab Forms (ELF) software and the skills necessary to get the most from their GC/MS instrument. The course relies on the GC/MS throughout the course to help teach main software applications and functions. Finally, use ELF to acquire data and process results using Data Review and Report View functions. Course topics include:
• Introduction to Thermo Scientific DSQ II or PolarisQ
• Introduction to ELF (in relation to Xcalibur software.)
• Creating master methods
• Making batches and templates
• Acquiring data
• Processing data
• Printing data and qualifying reports
• Instrument maintenance

Note: Please indicate your instrument (DSQ II or PolarisQ) at time of pre-registration.

Mass Frontier Software Operations

2 days
This course will help students master the latest version of Thermo Scientific Mass Frontier. Detailed presentations and hands-on exercises are provided for on all Mass Frontier™ modules in order to ensure a sound understanding of all its processes. The students will become familiar with the subjects of database generation and manipulation and spectra interpretation, as well as compound classification with the use of statistics. By the end of the course, students will be able to apply all software applications for their own purposes.

Additionally, a short course on the interpretation of CID spectra will be included, allowing the users to update the Fragmentation Library module with new mechanisms. Course topics include:
• Database Manager
• Chromatogram processor
• Fragments and mechanisms
• Spectra classifier
• Interpretation of CID spectra
  (for use with fragmentation library)

MetWorks Software Operations

2 days
This course is intended for small molecule ion trap and triple quadrupole users. This software operations course teaches users to identify important sample components and how to assign structures to the components – especially in metabolism-related applications. Course topics include:
• Thermo Scientific MetWorks components and features, including Workflow
• Creating background-subtracted files
• Creating a MetWorks method
• Data processing and reviewing of results
• Report generating
• Acquisition and processing a sequence of samples

Prerequisite: User should be well-versed in Data Dependent scanning and Thermo Scientific Xcalibur software operations, this course covers only software applications.

On-site Training is Available
For your convenience, all courses are available at your facility, and can be customized to suit your specific application. Contact us for details!
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For a schedule of course dates and locations visit: www.thermoscientific.com/education
**ToxLab Software Operations**

**3 days**

This course is designed to familiarize users with the operations of Thermo Scientific ToxLab software for use in the quantitative analysis of drugs of abuse in bodily fluids. Lectures along with hands-on experiments to further enhance the learning experience. Course topics include:

- Introduction to the Thermo Scientific TRACE GC Ultra oven including basic maintenance
- Introduction to Thermo Scientific DSQ GC/MS
- DSQ tuning
- Instrument setup
- ToxLab™ – Quantitative Analysis

**Prerequisite:** Student should be familiar with Xcalibur software and have a general understanding of mass spectrometry and gas chromatography.

**Xcalibur Software Operations**

**2.5 days**

This course is designed to familiarize students with the operation of Thermo Scientific Xcalibur software and encompasses both GC/MS and LC/MS techniques. The course will provide users with an understanding of the use of Xcalibur for both qualitative and quantitative analysis, as well as instrument setup. Students will be able to gain hands-on experience and work through multiple Xcalibur practicals. Course topics include:

- Xcalibur configuration for Windows
- Instrument configuration
- Sequence setup and options
- Processing methods
- Creating user libraries
- Quan browser
- Report generation and customization

**Quantum XLS Operations**

**4 days**

This course is designed to familiarize users with operating and maintaining the Thermo Scientific TRACE GC Ultra and the Quantum XLS mass spectrometer, plus working knowledge of Thermo Scientific Xcalibur software. Emphasis is given to quantitative methods using SRM and HSRM. Course consists of lectures along with laboratory experiments where participants will create qualitative and quantitative analysis processing methods and reports. Hardcopy of the training manual will be provided. Course topics include:

- Setup and maintenance of the TRACE GC Ultra
- Fundamentals and instrumentation of the Quantum XLS™
- Scan modes
- Quantum XLS tuning
- Xcalibur software
- XReport
- User libraries
- Chemical ionization
- Probe analysis

**LCQUAN Quantitative Operations — Analysis Under Regulatory Compliance**

**3 days**

**On-site only, please contact us for additional details**

This course will help users protect data and ensure compliance with 21 CFR Part 11 of FDA regulations when running Thermo Scientific LCQUAN on Thermo Scientific Xcalibur software. This course instructs users on managing data, data integrity, file structures, and security. In addition to general operation, tuning, and maintenance of Thermo Scientific TSQ Quantum systems, users will learn to perform quantitative analysis using LCQUAN. Course topics include:

- Operation of Quantum series instrumentation
- LCQUAN fundamentals and report templates
- Interaction with LIMS systems (where applicable)
- File structure, management, integrity, and security
- Data acquisition and processing
- Reviewing and auditing data
- Software and hardware through hands-on practicals
- Maintenance and troubleshooting
TSQ Quantum/Vantage QuickQuan Software Operations

On-site only, please contact us for additional details

This course will help students gain a complete knowledge of Thermo Scientific QuickQuan – the powerful software package designed to operate with Thermo Scientific Xcalibur and your Thermo Scientific TSQ system. With minimal user input, the software aids drug discovery labs to automatically optimize new chemical entities (NCE’s) for SRM experiments, generate LC/MS/MS methods, and perform quantitative analysis. The data is processed automatically, generating instant customized results using Thermo Scientific Xreport templates or custom Excel® macro templates. Course topics include:

• Operation of quantum instrumentation
• QuickQuan software including EZTune
• Plumbing of autosampler and HPLC systems
• Maintenance and troubleshooting

EI/CI Interpretation Module

2 days
Call for availability or on-site

This course is designed to introduce users to the underlying principles of classical mass spectrometry and teach the fundamental processes involved in interpreting electron ionization (EI) and chemical ionization (CI) mass spectra. Course topics include:

• Electron ionization theory
• Chemical ionization theory
• The nitrogen rule
• The double bond equivalent formula
• Isotopes for interpretation purposes
• Fragmentation mechanisms
• Commercial and user libraries
• Computer tools for spectral interpretation

Agilent 6890 Maintenance and Qualification

2 days

This course is designed for users who need to maintain, perform minor repairs, and qualify the Agilent 6890 Gas Chromatography system. Through lectures and hands-on lab experience, students will gain an understanding of maintenance procedures, minor repair procedures, and perform qualification tests.

Agilent 6890 Basic Operations

2 days

This course is designed for users who need to program methods, analyze samples and generate reports using the Agilent 6890 Gas Chromatography system. Through lectures and hands-on lab experience, students will gain an understanding of basic operation procedures, programming methods and sequence, analyzing samples and generating reports.

Agilent 1100 Maintenance and Qualification

3 days

This course is designed for users who need to maintain, perform minor repairs, and qualify the Agilent 1100 Liquid Chromatography system. Through lectures and hands-on lab experience, students will gain an understanding of maintenance procedures, minor repair procedures, and perform qualification tests.

Agilent 1100 Basic Operations

2 days

This course is designed for users who need to program methods, analyze samples and generate reports using the Agilent 1100 Liquid Chromatography system. Through lectures and hands-on lab experience, students will gain an understanding of basic operation procedures, programming methods and sequence, analyzing samples and generating reports.

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From AA and ICP to ICP-MS, XRF/XRD and OES, our experience and intrinsic knowledge of the market will help you expedite applications and streamline your process for maximum efficiency and productivity.

Whether it’s environmental, petrochemical, clinical, metals or cement, our experienced instructors will prepare you to operate your instrument and software with ease.
ELEMENTAL INSTRUMENT OPERATIONS

**iCAP 6000 Series Operations**

*3.5 days*

This course covers the essential aspects of instrument operation and iTEVA software, and splits into two sections each day: Lecture and Laboratory Practical. The lectures combine active PowerPoint® presentations, illustrations, and discussion. An interactive dynamic amongst students and instructor is strongly encouraged. Once inside the laboratory, the students run the show, with direction from the trainer, and provide course materials using concepts and information previously discussed in the classroom. Students take turns and are responsible for different tasks throughout the exercises utilizing a fully functioning iCAP 6000 Series ICP. Class sizes are intentionally kept to a maximum of 5 students ensuring everyone is able to participate. Course topics include:

- Theory of ICP
- Preventative maintenance
- Qualitative analysis
  - Full-frame imaging
- Instrument optimization
  - Manual and automated optimization routines
- Identifying and overcoming interferences in ICP
  - Background correction point function and positioning
  - Interfering element correction function and calculation
  - Method of standard addition function and setup
  - Internal standard correction function and setup
- Post-processing data
- Using publisher
  - Generating reports
  - Exportation into alternate formats
- Use of CETAC™ ASX520 autosampler
- Database management
  - Creating databases
  - Copying methods and data between databases
- Getting assistance from Thermo Fisher Scientific

**MicroXR Operations**

*3 days*

*On-site only, please contact us for additional details*

This course introduces energy-dispersive x-ray fluorescence analysis in a format suitable for both new and experienced users of the Thermo Scientific MicroXR analyzers and Expert Analysis software. The classes are done in your lab using real samples and your live instrument to emphasize the critical aspects of your specific application. Methods developed and evaluated in a small group will demonstrate the Expert Analysis software. At the completion of the course, attendees should be well prepared to develop new quantitative methods and to maintain existing methods. The course will be adapted to your specific needs, and can emphasize quantitative analysis, thickness measurements, or both. Course topics include:

- XRF measurement theory and statistics
- Qualitative, comparative and quantitative analysis
- Choice of excitation conditions
- Sample preparation
- Spectral acquisition and evaluation using Expert Analysis software
- Methods development
- Optimizing analysis methods
- Instrument maintenance basics

**XSERIES ICP-MS Operations**

*3.5 days*

This course is designed for users new to the Thermo Scientific XSERIES 2 instrument, and will familiarize them with instrument features, routine operation and maintenance. Course topics include:

- Introduction to ICP-MS
- Principles of operation of ICP-MS
- Evaluation of different interface designs and the use of collision cell technology (CCT) to address specific
- System optimization and instrument calibration routines
- Data acquisition (using a variety of calibration techniques), QA/QC and interpretation
- Routine maintenance

*Note:* Depending on the availability of instrumentation and equipment, additional select topics may include: cold plasma analysis, isotope ratio analysis and the use of additional sample introduction equipment (i.e., laser ablation, chromatography, and desolvating and ultrasonic nebulizers).

**High Resolution Inductively Coupled Plasma Mass Spectrometer (HR-ICP-MS): ELEMENT 2 and ELEMENT XR Operations**

*5 days*

*On-site only, please contact us for additional details*

This course is designed to familiarize users of the Thermo Scientific ELEMENT, ELEMENT 2 or ELEMENT XR with the instrument features, operation and maintenance. Topics covered will include system optimization, mass calibration, data acquisition (using a variety of calibration techniques) and interpretation. Depending on the availability of customer equipment, additional select topics may include: cold plasma analysis, isotope ratio analysis and the use of additional sample introduction equipment (i.e., laser ablation, chromatography, and desolvating or ultrasonic nebulizers).
IRIS Intrepid ICP Operations
3.5 days
On-site only, please contact us for additional details

This course covers the essential aspects of instrument operation including TEVA 32-bit software, either on the upgraded Thermo Scientific IRIS Advantage or the IRIS Intrepid/Intrepid II instruments. In the laboratory, students will put to use the information and practical spectroscopy presented in the lectures. The course also provides students with hands-on experience optimizing the instruments, setting up and running methods and using the autosampler to analyze samples. Course topics include:

- Atomic spectroscopy theory
- Instrument optimization
- Methods development
- Overcoming interferences

MagnaRay WDS Operations
3 days
On-site only, please contact us for additional details

This course is designed for users new to the Thermo Scientific MagnaRay WDS spectrometer and parallel beam WDS. The course emphasizes WDS theory and MagnaRay system operation, including calibration, identification and scanning. The course will also cover MagnaRay and the NS7 integration. Visit www.thermoscientific.com/education to learn more about this course.

Atomic Absorption (AA) Operations
3.5 days

Designed for the AA operator, this course covers all the essential topics concerned with flame/furnace optimization, methods development, and efficient operation of the instrument. The course explores both D2 and Zeeman background correction techniques and divides course time equally between lecture and laboratory. Users will participate in several guided experiments demonstrating method setup, the effects of changing various instrument settings, etc. while using full sets of standards and samples provided for performing these experiments. Course topics include:

- Atomic spectroscopy theory
- Solaar software
- Instrument optimization
- Methods development
- Troubleshooting

Note: Flame and furnace AA users will have a three and one-half day course. Flame ONLY users will attend the first two days of training at a cost of 50% of enrollment.

QUANT’X EDXRF Operations
3.5 days

This course introduces energy-dispersive x-ray fluorescence analysis in a format suitable for both new and experienced users of the Thermo Scientific QUANT’X analyzer and WinTrace software. Morning sessions cover theory and concepts using a ‘presentation and questions’ format, and afternoon sessions are done in our lab using real samples and live instrumentation to reinforce the morning subjects. Customers are encouraged to bring samples for discussion. Using those samples and our extensive library of standards, we will develop and evaluate methods with the small group to demonstrate the WinTrace software. At the completion of the course, attendees should be well prepared to develop new quantitative methods, maintain existing methods, and quickly evaluate ‘total unknown’ samples. The following topics covered include:

- XRF measurement theory and statistics
- Qualitative, comparative and quantitative analysis
- Excitation conditions and use of filters
- Sample preparation
- Spectral acquisition and evaluation using WinTrace software
- Methods development
- Optimizing analysis methods
- Instrument maintenance basics
- Post-processing and data presentation using advanced software options

XRF Operations with WINXRF or OXSAS Software
4 days

This course is designed for new users of the Thermo Scientific ADVANT’X Series XRF, 9800 XRF/XRD, OPTIM’X XRF, 9900 XRF. Students will learn the skills necessary to operate the instrument and optimize analytical results for their specific applications. Course topics include:

- X-ray theory
- Hardware overview
- Qualitative/quantitative analysis
- Evaluation of performance
- Energy profile
- High voltage and position calibration
- Sample preparation
- Liquid analysis
- Drift correction
- Calibration/regression analysis
- Inter-elemental correction
- Fundamental parameters
- Routine maintenance
- Service/parts orientation
- WINXRF and OXSAS Software
OE Operations with WINOE or OXSAS Software

4 days

This course is designed for new users who will learn the skills necessary to operate the instrument and optimize analytical results for their specific applications. Course topics include:

- Spark emission theory
- Hardware overview
- Software overview
- Optimization of results
- Precision
- Accuracy improvement
- Calibration
- Matrix dilution
- Inter-element corrections
- Drift correction
- Type standardization
- Sample preparation
- Trouble shooting analytical data
- Routine maintenance

ARL Automation Hardware & Maintenance (ARL 3460, ARL 4460 with ARL SMS-2000 automation system)

5 days
On-site only, please contact us for additional details

This course is designed to familiarize users of the Thermo Scientific ARL 3460 or ARL 4460 coupled to an ARL SMS-2000 automation system with the structure of the system. Students will learn maintenance and diagnostic techniques and how to establish and follow a maintenance schedule. Other topics include: overview of the periodic maintenance tables concerning the cleaning devices, the analysis table and its accessories, the SMS rack, the pneumatic system and the robot arm, general troubleshooting and diagnostics.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinXRF software.

ARL Automation Hardware & Maintenance (ARL 9900 with ARL SMS-2000 or SMS-XY Automation System)

5 days
On-site only, please contact us for additional details

This course is designed to familiarize users of Thermo Scientific ARL 9900 Series coupled to an ARL SMS-2000 or SMS-XY automation system with the structure of the system. Students will learn maintenance and diagnostic techniques and how to establish and follow a maintenance schedule. Topics include: overview of the periodic maintenance tables concerning the SMS rack, the pneumatic system and the robot arm, general troubleshooting and diagnostic.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinXRF software.

ARL X-ray and OES Hardware & Maintenance

5 days
On-site only, please contact us for additional details

This course is designed to familiarize users of all existing Thermo Scientific X-ray and OE spectrometers with the structure of the instrument. Students will learn maintenance and diagnostic techniques and how to establish and follow a maintenance schedule.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinXRF/WinOE software.

On-site Training is Available

For your convenience, all courses are available at your facility, and can be customized to suit your specific application. Contact us for details!

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For a schedule of course dates and locations visit: www.thermoscientific.com/education
ARL WinXRF/OXSAS Software Operations

5 days
On-site only, please contact us for additional details

Each designated software course will teach users the principles and techniques of their respective application software:

- Thermo Scientific WinXRF for use with the Thermo Scientific ARL ADVANT’X Series, ARL 9800, ARL OPTIM’X and ARL 9900
- Thermo Scientific OXSAS for use with the ARL ADVANT’X Series and ARL OPTIM’X

Users will learn the principles of X-ray fluorescence analyses, structure and overview of the WinXRF software, basics of system setup, diagnostic tools, instrument calibration, results exploitation, data security and practical work on PC.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and WinXRF software.

ARL WinXRF Software Modules

5 days
On-site only, please contact us for additional details

This course is designed for users of Thermo Scientific ARL ADVANT’X Series, ARL 9800, ARL OPTIM’X and ARL 9900 providing instruction to help students understand the Thermo Scientific WinXRF application software. The ARL WinXRF software options bundle:

- SPC (1.5 days)
- ARL Net (1.5 days)
- NBSGSC (1 day)
- Charge correction, Translate, Metaverage, Automatic Program Choice (1 day; optional course segment taught upon request.)

**SPC Module** covers loading and starting of SPC Light, interpretation of control charts, setting up of WinXRF, structure of the SPC Light, setting up of WinXRF for production monitoring by SPC Light, structure of the SPC Light database, management of SPC data files and printing of SPC reports.

**ARL Net Module** is a versatile package to transmit analysis results via a Local Area Network, using a variety of procedures, protocols and formats to best meet your needs.

**NBSGSC Module** sessions include setup and use NBSGSC (Theoretical Alphas).

**Charge Correction, Translate, Metaverage, Automatic Program Choice Module** covers the Charge Correction – an integrated option of WinXRF which calculates the weight of materials to be added to a furnace charge in order to bring out of specification materials within limits. Translate is a WinXRF language management philosophy option. The user will know how to setup a new language and to translate the messages. The student will also learn to set up and use the Average of Analysis Results (Metaverage).

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and WinXRF software.

ARL WinXRF Analytical UniQuant and QuantAS Options

3 days
On-site only, please contact us for additional details

This course will help users understand how to run and analyze samples and the philosophy of semi-quantitative analysis. The course provides an overview of principles and operation of the Thermo Scientific UniQuant program, principles of UniQuant calibration and applications, matrix specific adjustments, results handling and recalibration. The course continues with an overview of the principles and operation of QuantAS, principles of QuantAS calibration, applications and recalibration.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinXRF software.

ARL SparkDAT Software (ARL 4460)

2 days
On-site only, please contact us for additional details

This course is designed to teach users the principles and techniques of the Thermo Scientific SparkDAT software for the Thermo Scientific ARL 4460. The course provides a general overview of SparkDAT system and includes these topics:

- SparkDAT software and sparks view
- Installation and configuration of algorithms
- Standard applications and creation of SparkDAT programs incorporating algorithms for fast inclusions characterization

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinOE software.

ARL Automation Software

5 days
On-site only, please contact us for additional details

This course is designed for users of Thermo Scientific ARL Automation SMS-2000 and SMS-3000. The user will learn the principles and techniques of the application software for these OE or XRF automation systems. The course provides instructions regarding the software structures of the automation system, menu overview of Manager Level, configuration of menus and accounts, system operation and working parameters. The course also covers the details of the registration scheme, registration and running of production samples, system monitoring, events and alarms related to the automatic mode.

Prerequisites: Practical experience of at least three months following the installation of the instrument and general knowledge of Windows operating systems and Thermo Scientific WinOE software.
Informatics Software

Our team of Thermo Scientific Laboratory Information Management Systems (LIMS) and Chromatography Data Systems (CDS) instructors will help you expedite knowledge of these critical information systems and streamline your processes for maximum efficiency.
Administration of Atlas Instrument Control & Atlas Chromatographic Data Processing Advanced Topics

2 days

This course will demonstrate how Thermo Scientific Atlas Instrument Control and Acquisition works behind the scenes. This should help the user to understand, detect, investigate and solve problems with the Atlas system if they occur. Use, administration, and troubleshooting of specific instrument types will also be discussed. Course topics include:

- Chromserver
- Dataserver
- 247 Instrument Controller
- Instrument Types
- Instrument Control Components
- Dataserver/247 IC Functions
- Instrument-Specific Configuration
- Spectral Processing

Prerequisites: This course is for Atlas users who wish to enhance their knowledge and capabilities in the data processing functions of the Atlas system.

Report Manager for Atlas

2 days

This course is designed to cover all the key features for non-programmers yet allow the creation of sophisticated and professional looking reports. A user-friendly GUI allows rapid report development and viewing. Drag and drop features provide rapid editing and configuring for any report structure. This course employs a mixture of demonstration, experimentation and exercise to build appropriate skills. Course topics include:

- Hands-on interaction through a friendly graphical user interface
- Rapid report generation using real data from the outset
- Use of data tables, chromatograms, calibration curves, text and graphics
- Experience in working in interactive or batch mode

Prerequisites: Experienced Atlas users wishing to customize data reports. No programming skills are required for this course.

Introduction to Galileo

2 days

In this course you will acquire the fundamental knowledge you need to understand and use the standard Thermo Scientific Galileo LIMS product. It serves as an essential building block to becoming an expert user of Galileo. The course is practical while still covering the fundamentals of using the main features within Galileo.

Prerequisites: Project team members involved in implementing Galileo, advanced users and new hires requiring a certificate on the latest product version, consultants who require a fundamental knowledge of LIMS deployments, Galileo application managers and System Managers responsible for Galileo maintenance.

Using Atlas and System Administration for Atlas

5 days

This course leads to a full knowledge of administrative tasks for Thermo Scientific Atlas, helping students gain extensive experience with Atlas functionality and covering the major aspects of Atlas processing. With this knowledge, the student can ensure the most efficient use of Atlas is made. The student will also benefit from logical explanations of individual Atlas screens. The course also uses demonstrations and examples where appropriate. Data and user security are covered in-depth with students able to configure a system to their own requirements. Course topics include:

- Complete access to all Atlas functionality, without restrictions imposed by system administrators
- Free experimentation with safe data
- Realistic demonstrations and simulations

Prerequisites: New users and experienced users of Atlas with differing levels of knowledge.

Using Darwin and LIMS Administration for Darwin

2 days

This course will provide the fundamental knowledge required to effectively establish, configure, and manage the standard Thermo Scientific Darwin LIMS product. This course serves as an essential steppingstone to becoming a Darwin expert. Course topics include:

- Installation
- Operating Environment
- Security
- Application Properties
- Data Maintenance

Managing Nautilus

5 days

In this course, you will acquire the fundamental knowledge you need to understand and use the standard Thermo Scientific Nautilus LIMS product. The course is practical while still covering the fundamentals of using the main features within Nautilus. Course topics include:

- An understanding of LIMS
- Develop a clear understanding of Nautilus
- Examine in-depth the key Nautilus functionality
- The knowledge required to be able to map Nautilus features to your laboratory processes

Prerequisites: Project Team members involved in implementing Nautilus, advanced users and new hires requiring a certificate on the latest product version, consultants who require a fundamental knowledge of LIMS deployments, nautilus application managers and system managers responsible for Nautilus maintenance.
Introduction to GRAMS/AI and GRAMS Chemometrics with PLSplus/IQ

2 days

This course will help you to develop the basic knowledge needed for utilizing the Thermo Scientific GRAMS/AI and PLSplus/IQ software effectively for qualitative and quantitative spectral analysis with multivariate chemometric methods. It will also help you to develop the knowledge needed for utilizing the GRAMS/AI software effectively for a variety of data display and analysis tasks.

This course builds a fundamental understanding of the chemometric methods and the software tools available with GRAMS/AI and PLSplus/IQ through a combination of classroom instruction and hand-on exercises. Who should attend: Advanced GRAMS/AI users who are interested in performing chemometric analysis, current users and new hires requiring a certificate on the latest product version, and scientists and technicians who use GRAMS/AI for data display and analysis.

Course topics include:
- The theory behind the chemometric methods used in PLSplus/IQ
- The basic steps for building models using PLSplus/IQ
- How to build an effective training set
- Analyzing and interpreting experimental model results
- Predicting unknowns with the IQ Predict ActiveApp
- Optimizing qualitative and quantitative models
- How to combine qualitative and quantitative techniques
- The GRAMS/AI user interface
- Workspace customization
- Importing and exporting spectral and chromatographic data

Note: This course assumes a basic familiarity with the GRAMS/AI software. Users are encouraged to view the PLSplus/IQ tutorial prior to attending this course.

Retriever

2 days

In this course you will develop the required skills you will need to enable you to create custom reports using Thermo Scientific Retriever. This course provides an essential foundation in Retriever reporting. Who should attend: LIMS Application Managers, System Managers responsible for LIMS maintenance, and project team members involved in implementing Retriever reporting. Course topics include:
- Architecture
- Database Basics
- Navigation and Managing Users
- Database Connections
- Reporting
- Installation
- Administration
- Dashboards

Using Integration Manager

3 days

This course will help you acquire the skills to transform data using Thermo Scientific Integration Manager (IM). You will be introduced to the concepts behind IM and the tools used to integrate your data flow. Through hands-on workshops you will gain a basic knowledge of the techniques used to transform multiple data types. Course topics include:
- Introduction
- Data Transformation Techniques
  - Text to XML Transformations
  - XML to Text Transformations
  - XML to XML Transformations
- Installation and Deployment
- IM Components
  - Agent Types and Configuration
  - Use of Integration Points
  - Use of Integration Objects
  - Use of Interfaces
- Diagnostic Tools

Introduction to SampleManager

5 days

This course will provide the fundamental knowledge you need to use and deploy a standard LIMS solution. This course provides a detailed look at the key Thermo Scientific SampleManager functionality. Ideally, this training should coincide with the delivery of SampleManager. Course topics include:
- Examining in-depth the key SampleManager functionality
- The ability to login samples in an efficient way
- The knowledge required to be able to map your laboratory processes to SampleManager functionality

Prerequisites: Project Team members involved in implementing SampleManager, advanced users and new hires requiring a certificate on the latest product version, consultants who require a fundamental knowledge of LIMS deployments, SampleManager Application Managers and system Managers responsible for SampleManager maintenance.

For a schedule of course dates and locations visit: www.thermoscientific.com/education
LIMS Administration for SampleManager

4 days

This course will provide the fundamental knowledge required to effectively establish, configure, and manage the standard Thermo Scientific SampleManager LIMS product. This course is practical while providing you with the necessary tools and information to configure and manage your system. Course topics include:

• An in-depth explanation of the key tasks involved in managing a SampleManager installation
• An in-depth explanation of configuration items and their function
• An in-depth explanation of table definition and design

Prerequisites: SampleManager System Administrators, Consultants who require a full understanding of managing a standard LIMS SampleManager product and SampleManager Application Managers.

Programming in VGL

5 days

This course gives in-depth coverage of the facilities available in VGL. Delegates discover how sophisticated VGL programs can be used to access and process data in the SampleManager database, and how to write directly to the database, external files or third party software packages. This course is an essential part of becoming a VGL expert.

This course uses a hands-on approach with real life data where appropriate. Who should attend: Experienced Thermo Scientific SampleManager users and students wishing to customize SampleManager. Course topics include:

• Basic forms and lists
• Data retrieval from the SampleManager database
• VGL commands and facilities
• Libraries, constants, passing parameters and variables
• Calling standard SampleManager menu procedures from VGL programs and passing parameters to them
• Data creation/modification/deletion
• External data transfer
• Process spawning from VGL

Note: This course assumes you are already familiar with programming in some language.

VGL Objects for SampleManager

5 days

This course looks in-depth at the object-orientated features of VGL and will enable you to write code in a structured re-usable way. This course is an essential part of becoming a VGL expert. Course topics include:

• How to create and use user-defined classes and objects
• How to use the SMW graphical debugger
• How to create and use a number of classes
• Event driven window and prompt creation using forms
• How to inherit from standard classes
• How to modify properties and actions of VGL prompts
• How to store and retrieve information from memory using object databases
• How to link third party products using OLE

Prerequisites: Experienced VGL users.

Watson LIMS and Watson Sample Handling

4 days

In this course students will acquire the fundamental knowledge needed to configure and use the Thermo Scientific Watson LIMS product. In addition, participants will acquire the fundamental knowledge needed to utilize the Watson LIMS sample handling functions.

The class format is a mix of lecture and hands-on exercises, including a final practical exercise. Each participant receives a comprehensive training manual, which may also be used as a post-training reference. Course topics include:

• Watson System Fundamentals
• Projects
• Studies
• Study Actions
• Sample Tracking
• Assays
• Analytical Runs

Prerequisites: This course is designed for key individuals involved in the implementation, validation, post-implementation support, and day-to-day use of the Watson LIMS Application; and Watson LIMS users who are responsible for sample coordination and management.

Contact Us

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Microanalysis

For experienced and new users to our extensive line of NORAN precision products, we offer a myriad of course dates for our NSS/NS7 Operations course. Courses are held at the Madison, WI training institute and emphasizes energy dispersive theory for bulk sample analysis as it pertains to the operation of Thermo Scientific NORAN System SIX and 7 software.

NSS/NS7 Operations

3.5 days

This course is designed for both new and experienced Thermo Scientific NORAN System SIX and 7 users. The course emphasizes the theory of energy dispersive spectroscopy for bulk sample analysis and the operation of NORAN System SIX/7 software.

Course topics include:

• Microanalysis theory
• Spectral acquisition
• Optimizing analysis setup
• Qualitative and quantitative analysis
• Comparative analysis
• Image acquisition
• Spectral image extraction
• Spectral image-map extraction
• Compass-statistical analysis
• Feature sizing/Chemical typing
• Analysis automation
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