

thermoscientific

Thermo Scientific Training Courses



The key to your laboratory's success

2020 Training Programme Benelux

**ThermoFisher**  
SCIENTIFIC

# Invest in Yourself

People are the most valuable assets in any lab. We offer comprehensive, professional training and certification through a complete course portfolio that can help you achieve the most from your instrumentation and results.

Our ultimate goal is to provide you with a total solution for your analytical needs, and so we offer a wide range of training courses on:

- **Instrument operation – hardware and software**
- **Instrument maintenance**
- **Software and applications**

Optimal classroom settings and world-class instructors will enhance your learning experience and allow you to gain greater productivity. As experts in their disciplines, our experienced specialists can provide a variety of education solutions to ensure that students are able to get the most value from their investment and achieve relative practical and theoretical knowledge. A range of venues are available for your convenience: on-site or at one of our Centers of Excellence.

We look forward to discussing your training needs and working with you to ensure your success with our products.

# Table of Contents

<b>Life Sciences Mass Spectrometry (LSMS)</b>	<b>4</b>
Proteomics	5
Small Molecules	9
Training Schedule 2020	16
<b>Chromatography</b>	<b>17</b>
Chromeleon CDS Software	18
Ion Chromatography	19
HPLC Systems	21
Accelerated Solvent Extraction - ASE	23
On-Site training courses	24
Training Schedule 2020	25
<b>Trace Elemental Analysis</b>	<b>26</b>
Atomic Absorption Spectroscopy (AAS)	27
Inductively Coupled Plasma Spectroscopy (ICP-OES)	28
Training Schedule 2020	29
<b>Inorganic Mass Spectrometry</b>	<b>30</b>
ICP-MS	31
Training Schedule 2020	32
<b>Discrete Industrial Analyzers (DIA)</b>	<b>33</b>
Discrete Analysis	34
<b>Advance your Knowledge</b>	<b>35</b>
<b>How to Register</b>	<b>36</b>

# Life Sciences Mass Spectrometry

**Invest in Yourself.** Whether you would like to enhance your learning experience or gain greater productivity, the Life Sciences Mass Spectrometry courses are designed to ensure each student has time to address their specific topics of interest. The courses offer both practical and theoretical training and are taught by experienced and certified instructors.



# Life Sciences Mass Spectrometry

## Proteomics

### Training: Ion Trap and LTQ Orbitrap Biotech Operations

#### Course Objective:

This course is designed for users that have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ LTQ Orbitrap™ and ion trap mass spectrometers and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, setup and optimization of various data-dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific™ Xcalibur™ and Proteome Discoverer™ software programs. When ETD training is requested, the following topics can be incorporated to the course timetable: maintenance of ETD source, optimization, tuning and calibration of the ETD components, experimental set-up, ETD data processing.

#### The course material includes:

- Ion Trap and Orbitrap Theory
- Tuning and Calibration
- Hands-on ESI and NSI MS
- 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

This course is offered at customer site only

---

### Training: Q Exactive Biotech Operations

#### Course Objective:

This course is designed for users that have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ Q Exactive™ mass spectrometer and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, setup and optimization of the various data dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific Xcalibur, Proteome Discoverer, and software programs.

#### The course material includes:

- Quadrupole and Orbitrap Theory
- Quadrupole and Orbitrap Hardware
- Instrument Tuning and Calibration
- Basic nano-flow LC Method Development
- Data Dependent and Multiplexing Method Design
- Data Independent Acquisition (DIA)
- Parallel Reaction Monitoring (PRM)
- Proteome Discoverer Software
- Processing of Post Translation Modification Methods

# Life Sciences Mass Spectrometry

## Proteomics

### Training: TSQ Biotech Operations

#### Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ TSQ™ mass spectrometer user with instrument operation for the purposes of protein and peptide quantitation. It includes instruction for electrospray (ESI) and nanospray (NSI) ionization of proteins and peptides, instrument calibration and tuning, data collection, maintenance and functionality of Thermo Scientific TraceFinder software package. The training content can be customized according to the customer's specific needs.

#### The course material includes:

- TSQ Hardware and Theory
- Tuning and Calibration
- Hands-on ESI and NSI MS
- Maintenance
- Parameters necessary for Good Quantitation
- TraceFinder Software for Quantitative Methods
- Instrument Method Development
- Data Processing

This course is offered at customer site only

---

### Training: Fusion Biotech Operations

#### Course Objective:

This course is designed for users who have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ Orbitrap Fusion™, Fusion Lumos Tribrid and Thermo Scientific™ Orbitrap Eclipse™ spectrometers and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, and setup and optimization of various data-dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific Xcalibur and Proteome Discoverer software programs. When ETD training is requested, the following topics can be incorporated to the course timetable: maintenance of ETD source, optimization, tuning and calibration of the ETD components, experimental set-up, ETD data processing.

#### The course material includes:

- Dual Pressure Linear Ion Trap, Quadrupole and Orbitrap Theory
- Basic Tune and Calibration
- Hands-on ESI and NSI MS
- Data Dependent Method Design
- Post-Translational Modification Methods
- Data Independent Method Design
- Intact Protein and Top-Down
- Accurate Mass Methods
- Proteome Discoverer Software
- Basic Maintenance

This course is offered at customer site only

# Life Sciences Mass Spectrometry

## Proteomics

### Training: Exploris 480 Biotech Operations

#### Course Objective:

This course is designed for users that have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ Orbitrap Exploris™ 480 mass spectrometer and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, setup and optimization of the various data dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific Xcalibur, Proteome Discoverer, and software programs.

#### The course material includes:

- Quadrupole and Orbitrap Theory
- Quadrupole and Orbitrap Hardware
- Instrument Tuning and Calibration
- Basic nano-flow LC Method Development
- Data Dependent and Multiplexing Method Design
- Data Independent Acquisition (DIA)
- Parallel Reaction Monitoring (PRM)
- Proteome Discoverer Software
- Processing of Post Translation Modification Methods

---

### Training: Proteome Discoverer Software

#### Course Objective:

The aim of this training course is to provide new users with the ability to use the Thermo Scientific Proteome Discoverer software to its full potential. Proteome Discoverer is a flexible, expandable software platform for the analysis of qualitative and quantitative proteomics data. Detailed presentations will be given on all modules together with hands on exercises in order to ensure understanding of all the processes. The students will become familiar with database manipulation, database search parameters as well as the interpretation of results. By the end of the course they should be able to apply all software tools for their own purposes.

# Life Sciences Mass Spectrometry

## Proteomics

### **Training: BioPharma Finder Software – Peptide Mass Fingerprint Analysis & Intact Mass Analysis**

#### **Course Objective:**

BioPharma Finder is the new Thermo Scientific™ software package used for intact mass and peptide mass fingerprint analysis. For biotherapeutic proteins to be effective, they must be produced in biologically active forms with proper folding and post-translation modifications (PTMs).

BioPharma Finder software makes it easy to define the target protein sequence, select a proteolytic digest enzyme, and assign known and potential post-translational modifications to search. Protein sequences can be imported from FASTA and text files, or sequences can be pasted into a text box.

The aim of this training course is to provide new users with the ability to use BioPharma Finder software for peptide mass fingerprint analysis to its full potential. The user will be able to create automated workflows necessary for an in-depth characterization of biotherapeutic proteins (glycopeptides identification, disulfide bond mapping, quantification of PTM's including oxidation, deamidation, phosphorylation). The users will also learn how to perform error tolerant and amino acid substitution searches as well as processing peptide mapping raw data.

BioPharma Finder significantly improves the identification and characterization of intact proteins from mass spectrometric data. It is the only intact mass analysis software available today that takes full advantage of the ultra-high-resolution, accurate-mass data produced by Orbitrap-based mass spectrometers. BioPharma Finder is also capable of processing ion trap raw data. Detailed presentations will be given on all the options available with hands on exercises in order to ensure understanding of all the processes. The course will cover all the steps necessary to the use of the two built-in algorithms (Xtract and ReSpect), data processing options, deconvoluted data handling and reporting. Guidelines on intact protein analysis for Thermo Scientific mass spectrometers will also be provided.

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: Fusion Operations

#### Course Objective:

The Fusion Operations course is designed for users that have previous LC-MS experience and would like to familiarize themselves with the Orbitrap Fusion mass spectrometer. The course will cover API and ion trap theory, tuning, calibration, data collection, general functionality of the Xcalibur software and main workflows for additional processing softwares. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing (TraceFinder and Compound Discoverer).

#### The course material includes:

- Dual Pressure Linear Ion Trap, Quadrupole and Orbitrap Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Data Dependent Method Design
- Introduction to TraceFinder, Compound Discoverer and Freestyle
- Accurate Mass Methods
- Parallel Detection Methods
- Introduction to Elemental Composition and Structure Elucidation

---

### Training: Ion Trap Operations

#### Course Objective:

The aim of this training course is to familiarize the new ion trap user with basic instrument operation, including API and ion trap theory (linear and 3D, single and dual traps), tuning, calibration, data collection, maintenance, and general functionality of the Xcalibur software package. The focus of this course is small molecule analysis for both qualitative and quantitative purposes. No attempt is made to teach protein mapping or peptide sequencing. Students desiring focused instruction on peptide/protein analysis should explore the possibility of taking one of the Biotech courses on offer, in lieu of this course.

#### The course material includes:

- 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 Maintenance

**This course is offered at customer site only**

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: LTQ Orbitrap Operations

#### Course Objective:

The LTQ Orbitrap Operations course is designed for users that have previous LC-MS experience and would like to familiarize themselves with the LTQ Orbitrap mass spectrometer. The course will cover API and ion trap theory, tuning, calibration, data collection and general functionality of the Xcalibur software. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing.

#### The course material includes:

- LTQ 2D Ion Trap and Orbitrap Theory (Single and Dual Traps)
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Instrument Method Development for LC/FTMS
- Introduction to Qual Browser/Freestyle
- Accurate Mass Methods
- Data Dependent Analysis
- Introduction to Elemental Composition and Structure Elucidation

**This course is offered at customer site only**

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: Compound Discoverer Software

#### Course Objective:

The aim of this training course is to provide new users with the ability to use the Thermo Scientific™ Compound Discoverer™ software to its full potential.

Compound Discoverer software ensures confident compound identification and structural elucidation in applications as diverse as metabolism, unknown metabolomics, pharmaceutical metabolism, impurity analysis, E&L, forensic toxicology and environmental research. The software helps researchers plan how data will be collected, organized, stored and reported with the final result in mind. Its node-assembled processing workflows, advanced algorithms, and study-oriented data storage allow users to quickly process and assemble data collected from multiple samples into a unified report.

The training course will cover all the aspects of the software including:

- Untargeted compound detection with isotope and adduct grouping
- Database searching using mzCloud™, Chemspider, KEGG or own databases
- Expected compound search including dealkylation and dearylation predictions and transformation products
- Fragment ion search (FISh) and structure annotations
- Compare with control experiments
- Background handling
- Reporting

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: TSQ Operations

#### Course Objective:

The aim of this training course is to familiarize the Thermo Scientific™ TSQ™ mass spectrometer user with instrument operation including instrument calibration and tuning, data collection and processing, maintenance and functionality of the Thermo Scientific™ Chromeleon™ CDS Software package. The focus of this training course is small molecule quantitation and the different approaches enabled by the hardware and software in this field will be explored. The training content can be customized according to the customer's specific needs.

#### The course material includes:

- TSQ Hardware and Theory
  - Tuning and Calibration
  - Hands-on ESI and APCI MS
  - Maintenance
  - Parameters necessary for Good Quantitation
  - Chromeleon CDS Software for Quantitative Methods
  - Instrument Method Development
  - Data Processing
- 

### Training: Exactive Operations

#### Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ Exactive™ mass spectrometer user with the Orbitrap technology. This will cover API and Orbitrap theory, tuning, calibration, data collection and general functionality of the Thermo Scientific Xcalibur and TraceFinder software packages. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing.

#### The course material includes:

- Overview of Theory and Practical Operation of the Thermo Scientific Orbitrap Mass Analyzer
- System Tuning and Calibration Procedures
- Preventative Maintenance and Troubleshooting Procedures
- Method and Sequence Setup
- Data Processing and Reporting

**This course is offered at customer site only**

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: Q Exactive Operations

#### Course Objective:

The aim of this training course is to familiarise the new Q Exactive user with Orbitrap technology. The training agenda covers API, Quadrupole and Orbitrap theory, tuning, calibration, data collection and general functionality of the Thermo Scientific Xcalibur and TraceFinder software packages. The emphasis of the training course is on small molecule analysis both from a qualitative and quantitative point of view, on accurate mass applications and data processing.

#### The course material includes:

- API, Quadrupole and Orbitrap Theory
- Q Exactive Hardware Components
- Tuning and Calibration
- Quantitative Set Up and Processing
- Qualitative Set Up and Processing
- Non Targeted/Unknown Screening
- Targeted Screening
- Troubleshooting and Maintenance

---

### Training: Automated Online Sample Preparation Using TurboFlow Technology

#### Course Objective:

The aim of this training course is to familiarize the new user with Thermo Scientific™ TurboFlow™ technology that can be used in conjunction with Thermo Scientific mass spectrometers and allows elimination of sample preparation techniques. The training will cover the theory of turbulent flow chromatography, hardware setup and maintenance, method development and data acquisition. The students will be guided through all principles of operation and hands on examples will be used for successful method development.

#### The course material includes:

- Theory of Turbulent Flow Chromatography
- Hardware Set Up: Autosampler, Injector Ports, Loading and Eluting Pumps, Multiple Column Module (MCM)
- Acquisition and processing Software: Method Creation, Batch Set Up, Pressure Trace Read Backs
- Quick Elute Methods
- Focus Mode Method Set Up
  - *Turbo Flow Column Selection*
  - *Elution Optimization from Analytical Columns*
  - *Method Variables*

**This course is offered at customer site only**

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: EQuan

#### Course Objective:

The aim of this course is to familiarize the new user with the Thermo Scientific™ EQuan large volume injection technique. The training will cover the principles of operation and the theory of the method, hardware setup and maintenance, method setup and data acquisition. All considerations with respect to large volume injections will be discussed. This training module can be combined with any of the instrument Operations courses on offer.

**This course is offered at customer site only**

---

### Training: TraceFinder Software

#### Course Objective:

Thermo Scientific™ TraceFinder™ is a software package with built-in workflows that have been developed to assist in routine analysis of small molecules applications. The aim of this training course is to enable the users to implement fully automated acquisition and processing workflows. Detailed presentations will be given on all TraceFinder functionalities together with hands on exercises in order to ensure understanding of all the processes. The software setup, user selection and all the steps necessary for data collection and processing, data analysis and report generation will be covered. This training module can be combined with any of the instrument Operations courses on offer.

---

### Training: LipidSearch

#### Course Objective:

Thermo Scientific LipidSearch software provides automatic identification and relative quantification of cellular lipid molecular species from large amounts of mass spectrometric data obtained in nano-infusion or LC-MS experiments. During the course you will learn how to use the software for different analysis conditions. The student will use practical examples to explore the lipid database, the ID module and how to perform relative quantitation. The various output options will be discussed. By the end of the student will be able to use LipidSearch to successfully analyse their lipidomics data.

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: ISQ EC/EM Operations

#### Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ ISQ™ EC/EM mass spectrometer user with instrument operation including electrospray ionization, quadrupole principles, compound tuning, instrument calibration, data collection, maintenance and general functionality of the Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System (CDS) software package. The focus of this course is small molecule analysis for both qualitative and quantitative purposes.

#### The course material includes:

- ISQ EC Hardware Components
- Maintenance
- Tuning and Mass Calibration
- Compound Optimization and Method Development
- Quantitative SIM Analysis by Electrospray
- Quantitation using Chromeleon CDS
- Fragmentation
- Qualitative Processing

# Training Schedule 2020

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TSQ Operations						8-9					16-17	



Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

# Chromatography

**Real-World Knowledge.** For experienced and new users to our extensive line of Chromatography instruments, we offer both practical and theoretical training courses 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.



# Chromeleon CDS Software

## Training: Introduction to Chromeleon 7 CDS – Level 1

### Course Outline

- Getting started
- General navigation
- Basic sequencing and programming
- Basic calibration
- Manual and automatic instrument operation
- Collecting data
- Data processing
- Specially requested topics (time permitting)

### Who Should Attend?

This one day course has been designed for chromatographers who are new to the Chromeleon CDS workstation or for existing users who require refresher training.

---

## Training: Next Steps in Chromeleon 7 CDS – Level 2

### Course Outline

- Advanced sequencing and programming
- Building and managing eWorkflows
- Report writing and editing
- Queries
- System suitability testing
- Specially requested topics (time permitting)

### Who Should Attend?

This two day course has been designed for experienced users of Chromeleon CDS or delegates who have attended the introductory course.



# Ion Chromatography (IC)

## Training: Ion Chromatography Theory & Troubleshooting Course

### Course Objective:

- Basic Ion Chromatography theory
- System functions
- Frontline hardware maintenance
- Column care
- Developing troubleshooting skills

Courses are grouped to maximize the best utilization for the operator on their particular product line.

### Who Should Attend?

The courses are designed to help users who are new to the technique and instrumentation of Ion Chromatography or for those who want to enhance their theoretical understanding of Ion Chromatography and wish to carry out frontline maintenance.

---

## Training: HPAEC-PAD Theory & Troubleshooting Course

### Course Objective:

- Fundamentals of Electrochemical Detection
- System functions
- Frontline hardware maintenance
- CarboPac column care
- Developing troubleshooting skills

### Who Should Attend?

The courses are designed to help users who are new to the technique and instrumentation of Ion Chromatography or for those who want to enhance their theoretical understanding of Ion Chromatography with electrochemical detector and wish to carry out frontline maintenance.



# Ion Chromatography (IC)

## Training: IC Method Development

### Course Objective:

- Increase of actual skills for method development
- Discussions about separation and detection techniques
- Making a roadmap of method development
- Use of "Virtual Column"
- Discussions of Examples which can be used in own environment

### Who Should Attend?

You should have a basic knowledge of Ion Chromatography.

**This course is offered at customer site only**

---

## Training: Carbohydrates Method Development

### Course Objective:

- Understand and explain the workflow for Carbohydrates analysis
- Identify the key parameters that affect Carbohydrates detection
- Understand best practices for Carbohydrates sample preparation
- Increase overall skills in method development
- Discussions about separation and detection techniques
- Making a roadmap of method development
- Use of "Virtual Column"
- Discussions of Examples which can be used in own environment

### Who Should Attend?

You should have a basic knowledge of Ion Chromatography.

**This course is offered at customer site only**

# HPLC Systems

## Training: Theory and Troubleshooting Course for UltiMate 3000

### Course Outline

- A basic introduction to HPLC.
- Understanding of the practical aspects of the instrument.
- Practical tips to improve system performance.
- Information regarding useful operation parameters.
- An overall familiarization of the Thermo Scientific™ UltiMate™ 3000 systems.
- Effectively detecting, troubleshooting and rectifying common issues.
- Performing instrument maintenance.
- Carrying out relevant diagnostic tests.
- Experience from hands-on laboratory exercises.
- Replacing common HPLC parts.

### Who Should Attend?

This course has been designed for new users or potential users of the UltiMate 3000 HPLC and UltiMate 3000 RSLC (Rapid Separation) systems and for those who wish to carry out frontline maintenance.

**This course is offered at customer site only**



# HPLC Systems

## Training: Theory and Troubleshooting Course for Vanquish

### Course Outline

- A basic introduction to HPLC.
- Understanding of the practical aspects of the instrument.
- Practical tips to improve system performance.
- Information regarding useful operation parameters.
- An overall familiarization of the Thermo Scientific™ Vanquish™ and Vanquish Flex systems.
- Effectively detecting, troubleshooting and rectifying common issues.
- Performing instrument maintenance.
- Carrying out relevant diagnostic tests.
- Experience from hands-on laboratory exercises.
- Replacing common HPLC parts.

### Who Should Attend?

This course has been designed for new users or potential users of the Vanquish and Vanquish Flex systems and for those who wish to carry out frontline maintenance.



# Accelerated Solvent Extraction (ASE)

## Theory and Troubleshooting Accelerated Solvent Extraction (ASE)

### Course Objective:

- Theory of Accelerated Solvent Extraction
- Sample operation
- Method development using ASE technology
- Hands-on laboratory exercises
- Replacing essential parts when required
- Optimizing extraction conditions
- Overview of instruments operation
- Performing instrument maintenance
- Troubleshooting ASE systems

### Who Should Attend?

This course is suitable for users of any Thermo Scientific Dionex ASE Accelerated Solvent Extractor product to develop their skills and understanding of the Dionex ASE™ systems.

**This course is offered at customer site only**



# TSQ Operations

## Course Objective

The aim of this training course is to familiarize the Thermo Scientific™ TSQ™ mass spectrometer user with instrument operation including instrument calibration and tuning, data collection and processing, maintenance and functionality of the Thermo Scientific™ Chromeleon™ CDS Software package. The focus of this training course is small molecule quantitation and the different approaches enabled by the hardware and software in this field will be explored. The training content can be customized according to the customer's specific needs.

## The course material includes:

- TSQ Hardware and Theory
- Tuning and Calibration
- Hands-on ESI and APCI MS
- Maintenance
- Parameters necessary for Good Quantitation
- Chromeleon CDS Software for Quantitative Methods
- Instrument Method Development
- Data Processing

---

## On-Site Training Course

### Course Description

On-site training provides your company with the opportunity to create a custom made course which meets your specific requirements. Customized training courses of various lengths and content can be designed and held in your training facility, laboratory or at one of our locations.

### Courses can include any of the topics covered in the previous pages plus:

- Software Features for Photodiode Array Detection
- Software Features for Report Publishing
- Using Chromeleon to Comply with 21 CFR 11
- Chromeleon Software Features for Administrators
- Advanced Software Features for Fraction Collection
- Thermo Scientific™ Dionex™ ASE™ instruments
- AutoTrace Solid Phase Extraction
- Electrochemical and CAD Detectors
- Dionex Ultimate Nano and Capillary LC Systems operations

# Training Schedule 2020

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Introduction to Chromeleon 7.2 CDS – Level 1		4				2				6		
Next Steps in Chromeleon 7.2 CDS – Level 2				21-22						27-28		
Ion Chromatography – Theory and Troubleshooting			3-4								3-4	
HPAEC-PAD – Theory and Troubleshooting			7-8								17-18	
Theory and Troubleshooting Course for Vanquish					12-13						10-11	
TSQ Operations (LC-MS)						8-9					16-17	



Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

# Trace Elemental Analysis

**Optimize Your Processes.** From AAS to ICP, 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 or clinical, our experienced instructors will prepare you to operate your instrument and software with ease.



# Trace Elemental Analysis

## Atomic Absorption Spectroscopy (AAS)

### Training: Flame AAS Operations

#### Course Objective:

This course is designed for the Thermo Scientific AAS Operator and covers all the essential topics related to flame optimization, method development and efficient operation of the instrument.

#### The course material includes:

- Absorption and Emission Theory
  - Hardware: Set up, Use and Optimization
  - Correction System for Non-Specific Absorptions
  - Influence of Experimental Parameters
  - Absorption and Emission Analysis
  - Non-Specific Absorption and Chemical Interferences
  - Maintenance
  - Sample Solubilization
  - Quality Control Tests
- 

### Training: Furnace AAS Operations

#### Course Objective:

This course is designed for the Thermo Scientific AAS Operator and covers all the essential topics related to optimization of a furnace AAS system, method development and efficient operation of the instrument.

#### The course material includes:

- Theory of Absorption
- Development of an Analytical Method
- Hardware: Set Up, Use and Optimization
- Non-Specific Absorption and Matrix Modifiers
- Correction System for Non-Specific Absorptions
- Maintenance
- Sample Solubilization
- Influence of Experimental Parameters
- Quality Control Tests

# Trace Elemental Analysis

## ICP-OES

### Training: ICP-OES Operations

#### Course Objective:

The aim of this is to improve the theoretical knowledge and practical skills of the Thermo Scientific ICP-OES user. The course will cover atomic spectroscopy theory, plasma related topics, instrument hardware, tuning and method set-up, functionalities of the software package, basic maintenance and troubleshooting.

#### The course material includes:

- Atomic Spectroscopy Theory
- Instrument Optimisation
- Identifying and Overcoming Interferences in ICP
- Overview of Software Packages available
- Quantitative Analysis
- Instrument Hardware, Maintenance and Troubleshooting

# Training Schedule 2020

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ICP-OES Operations			24						17			



Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

# Inorganic Mass Spectrometry

**Increase Your Efficiency.** Designed to offer both practical and theoretical training, the Inorganic Mass Spectrometry courses are taught by experienced and certified instructors. Covering a wide range of techniques our courses ensure that the customer interests and needs are covered regardless of the uniqueness of their application.



# Inorganic Mass Spectrometry

## ICP-MS

### Training: iCAP RQ Operations

#### Course Objective:

This course covers the fundamentals of the Thermo Scientific™ iCAP™ RQ ICP-MS systems operation and maintenance with a mixture of lectures and practical sessions. Topics include atomic spectroscopy theory, plasma description, hardware, tuning and method setup, functionalities of the Thermo Scientific™ Qtegra™ ISDS software package, basic maintenance and troubleshooting.

#### The course material includes:

- Quadrupole ICP-MS Fundamentals
- ICP-MS Analysis and Method Development
- Analytical Issues: Sample Preparation, Matrix Effects
- Calibration
- Data Management and Processing
- Qualification and Performances Report
- Maintenance
- Interferences and Solutions
- Flatapole Technology (Q Cell)
- Multi-Elements and Multi-Modes Analysis

# Training Schedule 2020

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
iCAP Q Operations			9-10						14-15			



Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

# Discrete Industrial Analyzers (DIA)

**Improve your productivity.** Our discrete nutrient analysers will offer a complete solution to rapid, random access sample analysis with efficient dip and sip sample and reagent consumption. Our experts in environmental, industrial, brewing, food and beverage analysis will provide you with 'hands on' instrument training using the intuitive software.



# Discrete Industrial Analyzers

## Training: Thermo Scientific™ Gallery™/Gallery Plus/Gallery Plus Beermaster Automated Photometric Analyzers

### Course Objective:

The aim of this training course is to familiarise the new user with the principles of discrete analysis and instrument components using the bench top analysers. Then the emphasis shifts to the software features, routine operation, explanation of Test Flows and their effect on range and limits of detection, through to results reporting, database management and basic troubleshooting.

### The course material includes:

- Hardware Components
- Software Features
- Routine operation
- Method Test Flow Explanation
- Result Reporting and Database Management
- Preventative Maintenance and Basic Troubleshooting

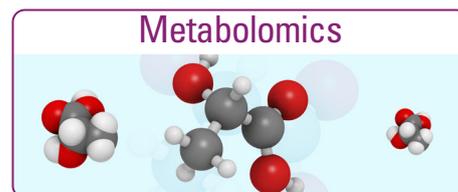
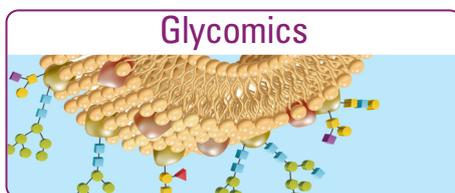
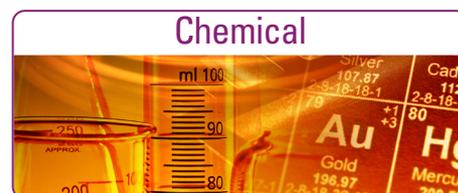
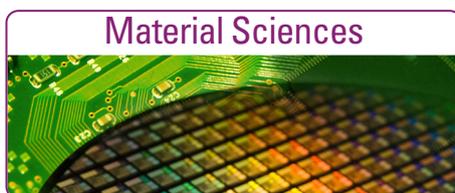
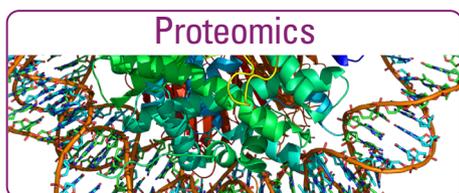
**This course is offered at customer site only**

# Advance Your Knowledge

Stay in touch and receive tailored communications specific to your interests

Join one of our communities to access a wealth of information housed in our Knowledge Libraries. Each library is a collection of scientific applications literature, videos, webinars and resources based on your preference.

Scan the QR code or visit [thermofisher.com/my-community](http://thermofisher.com/my-community)



# How to Register

For further information or to register on any of the courses listed, please use the following:

**Email:** [training.cmd.eu@thermofisher.com](mailto:training.cmd.eu@thermofisher.com)

**Phone:** + 31(0) 765 795 555

**Fax:** + 31(0) 765 810 961

**Web:** [thermofisher.com/eustraining](http://thermofisher.com/eustraining)

Thermo Fisher Scientific Takkebijsters 1  
4817BL Breda  
The Netherlands

## 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.
- In the event of a venue change, you will be notified by a Thermo Scientific representative.
- Thermo Fisher Scientific will not be responsible for expenses incurred (for example, non-refundable airline reservations) if the course is cancelled or moved 30 calendar days prior to the scheduled start date.
- Attendee substitutions may be made at any time upon notification of the Training Institute Co-ordinator.
- Enrollment in your desired training course(s) is not guaranteed until receipt of the registration documents and confirmed method of payment.

## Refund Policy

- 100% refund for cancellations received 15+ 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.

[www.thermofisher.com](http://www.thermofisher.com)

For Research Use Only. Not for use in diagnostic procedures. ©2019 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries. This information is presented as an example of the capabilities of Thermo Fisher Scientific products. It is not intended to encourage use of these products in any manners that might infringe the intellectual property rights of others. Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

**Africa** +43 1 333 50 34 0

**Australia** +61 3 9757 4300

**Austria** + 01 333 50 34 0

**Belgium** +32 53 73 42 41

**Canada** +1 800 530 8447

**China** 800 810 5118 (free call domestic)  
400 650 5118

**Denmark** +45 70 23 62 60

**Europe-Other** +43 1 333 50 34 0

**Finland** +358 10 3292 200

**France** +33 1 60 92 48 00

**Germany** +49 6103 408 1014

**India** +91 22 6742 9494

**Italy** +39 02 950 591

**Japan** +81 45 453 9100

**Korea** +82 2 3420 8600

**Latin America** +1 561 688 8700

**Middle East** +43 1 333 50 34 0

**Netherlands** +31 76 579 55 55

**New Zealand** +64 9 980 6700

**Norway** +46 8 556 468 00

**Russia/CIS** +43 1 333 50 34 0

**Singapore** +65 6289 1190

**Spain** +34 914 845 965

**Sweden** +46 8 556 468 00

**Switzerland** +41 61 716 77 00

**UK** +44 1442 233555

**USA** +1 800 532 4752

**ThermoFisher**  
SCIENTIFIC