

thermoscientific

Thermo Scientific Training Courses



## The key to your laboratory's success

2020 Training Programme

Denmark, Finland, Iceland, Norway, Sweden

**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.

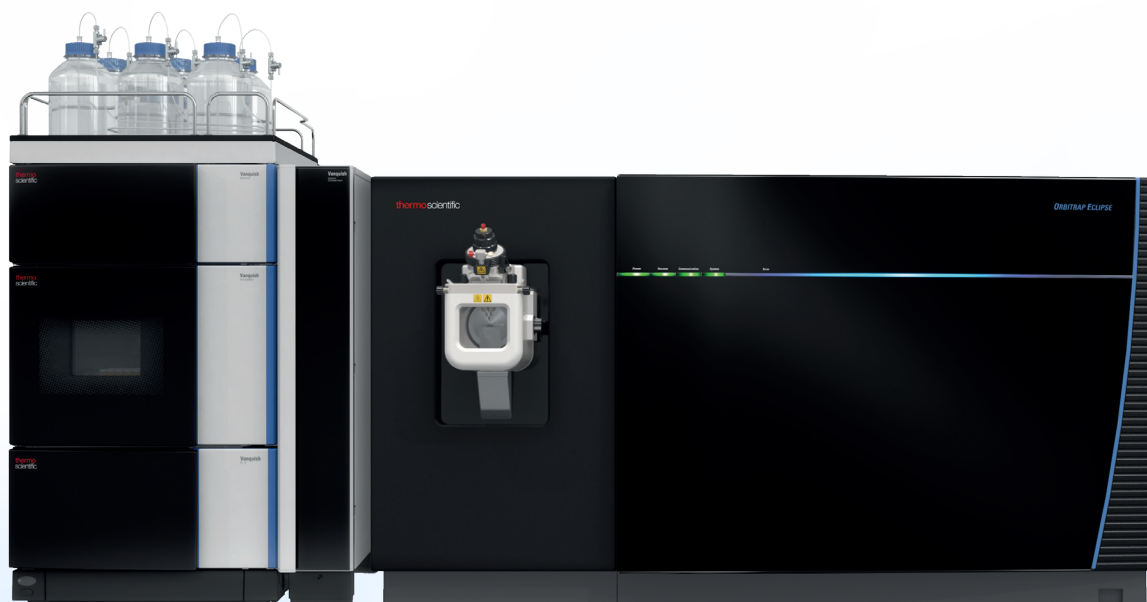
We look forward to discussing your training needs and working with you to ensure your success with our products.

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# 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

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### 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

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### 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

# 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



# Life Sciences Mass Spectrometry

## Proteomics

### 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.

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### 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

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### 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 new TSQ user with instrument operation including atmospheric pressure ionization, quadrupole principles, compound tuning, instrument calibration, data collection, maintenance and general functionality of Xcalibur and Thermo Scientific™ TraceFinder™ software packages. The focus of this training course is small molecule quantitation and the different approaches enabled by hardware and software in this field will be explored. Customers interested in the quantitation of peptides and proteins should choose the TSQ Biotech Operations course instead.

#### The course material includes:

- TSQ Hardware Components
  - TSQ Scan Modes
  - TSQ Instrument Control
  - Quantitation using TraceFinder
  - Reporting
  - User Maintenance
- 

### 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

# 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

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### 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

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### 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.

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### 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
- Fragmentation
- Qualitative Processing



# Training Schedule 2020

We currently don't offer any LSMS courses in our facilities in Denmark, Finland, and Sweden. However all the courses described in the brochure can be offered at customer sites. LSMS courses are offered at the following facilities:

- Hemel Hempstead, UK
- Villebon sur Yvette, France

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.



# Chromatography

## GC

### Training: GC Operations

#### Course Objective:

The aim of this course is to familiarize the new Thermo Scientific GC user with basic instrument operation including gas chromatography theory and optimization, routine maintenance, data acquisition and data processing.

#### The course material includes:

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

### Training: Headspace Gas Chromatography – Technique and Thermo Scientific™ TriPlus™ 300 HS Familiarization

#### Course Objective:

The course is intended for those new to the technique of Headspace Gas Chromatography and seeks to demonstrate how to build and optimize methods to maximize both sensitivity and precision. The course explores various headspace techniques such as partition, total vaporization and Multiple Headspace Extraction (MHE) and explains which technique is most appropriate for various analytical challenges. This training course is an intensive mixture of theory and practical with instrument operation and maintenance high on the agenda.

#### The course material includes:

- Basic Headspace GC Theory
- Method Development
- Influence of HS variables
- HS-GC techniques
- Instrument Calibration
- Liner and column selection
- Instrument maintenance
- Troubleshooting

# Chromatography

GC

## Training: TriPlus Robotic Sampler Handler Familiarization – Gas Chromatography

### Course Objective:

This operations training course is intended for new users of the Thermo Scientific™ TriPlus RSH™ Autosampler. The aim of the course is to deliver a better understanding of automated liquid injection, headspace sampling and solid phase micro extraction using the TriPlus RSH. This training course is an intensive mixture of theory and practical with instrument operation and maintenance high on the agenda.

### The course material includes:

- Brief Introduction to liquid injection, Headspace and SPME
- Introduction to the TriPlus RSH and components options
- Teaching and checking your objects
- Configuring your TriPlus RSH for Liquids, Headspace and SPME
- Method Development (liquids, Headspace and SPME)
- Instrument maintenance
- Prep cycles
- Troubleshooting

# Chromatography

## GC-MS

### Training: ISQ Operations

#### Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ ISQ™ GC-MS system user with basic instrument operation including gas chromatography, optimization for mass spectrometry, maintenance, EI, CI and quadrupole theory, tuning, calibration, data acquisition, data processing and the general functionality of the Thermo Scientific software package.

#### The course material includes:

- GC Theory and Optimisation (EI and CI)
  - Quadrupole Theory
  - GC and ISQ Hardware and Maintenance
  - Scan Functions
  - Qualitative Set Up and Processing
  - Quantitative Set Up and Processing
  - Introduction to new software packages for GC-MS
- 

### Training: TSQ 9000 Operations

#### Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ TSQ™ 9000 system with basic instrument operation including gas chromatography optimization for mass spectrometry, maintenance, EI, CI and quadrupole theory, tuning, calibration, data acquisition, automated SRM development, data processing and the general functionality of the Thermo Scientific Chromeleon software package.

#### The course material includes:

- GC Theory and Optimization (EI and CI)
- Quadrupole Theory
- GC and TSQ 9000 Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing
- Quantitative Set Up and Processing

# Chromatography

## GC-MS

### Training: Q Exactive GC-MS/MS Operations

#### Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ Q Exactive™ GC Orbitrap™ GC-MS/MS system with basic instrument operation including gas chromatography optimization for mass spectrometry, maintenance, EI, CI, MS/MS and Orbitrap theory, tuning, calibration, data acquisition, data processing and the general functionality of the TraceFinder software package.

#### The course material includes:

- GC Theory and MS Source Optimization (EI and CI)
- High resolution and accurate mass: definitions
- Orbitrap Theory
- GC and Q Exactive Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing TraceFinder
  - Target screening with a database
  - Deconvolution and High Resolution screening
- Quantitative Set Up and Processing TraceFinder

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### Training: Exactive GC-MS Operations

#### Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ Exactive™ GC Orbitrap™ GC-MS system with basic instrument operation including gas chromatography optimization for mass spectrometry, maintenance, EI, CI, MS and Orbitrap theory, tuning, calibration, data acquisition, data processing and the general functionality of the software package.

#### The course material includes:

- GC Theory and MS Source Optimization (EI and CI)
- High resolution and accurate mass: definitions
- Orbitrap Theory
- GC and Exactive Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing TraceFinder
  - Target screening with a database
  - Deconvolution and High Resolution screening
- Quantitative Set Up and Processing TraceFinder

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

# 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.

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## 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.





# Chromeleon CDS Software

## Training: Chromeleon 7.2 CDS – Reporting

### Description

The training lasts one day and addresses experienced users, who want to create customized report definition files taking full advantage of the possibilities that are offered by Chromeleon CDS. During the training, a customized report will be created and it will represent a template for future needs.

The training contains the following topics:

- Report definition files overview
- Report objects overview
- Special report variables
- Use of excel formulas
- Use of “unique identifiers”

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## Training: Chromeleon 7.2 CDS – IT Administrator

### Description

The training lasts one day and addresses employees who need to integrate Chromeleon CDS into the existing IT infrastructure. The training contains the following topics:

- Overview of the new architecture in Dionex Chromeleon 7.2 CDS
  - Scheduler (Archiving and Backup)
  - Global Dionex Chromeleon CDS Policies
- Installation and Configuration of Dionex Chromeleon 7.2 CDS
  - Instrument Configuration
  - License Management
  - User Management (Roles, Privileges and Access Groups)
  - Data Vault Management (with SQL Server)
  - Troubleshooting
  - The new Enterprise Documentation

# Ion Chromatography (IC)

## Training: Ion Chromatography New Operator Course

### Course Objective:

The course covers basic ion chromatography theory with explanations as to how each component of the system functions, ensuring the operator can perform basic analysis together with a useful understanding of ion chromatography instrumentation, including automation.

Courses are grouped to suit customer needs.

### 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.

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## Training: Ion Chromatography Maintenance and Troubleshooting

### Course Objective:

The maintenance and troubleshooting courses will assist those undertaking basic maintenance of their Ion Chromatography systems. The courses cover front line hardware maintenance, column care and assist the operator in developing troubleshooting skills.

Courses are grouped to suit customer needs.

### Who Should Attend?

These courses would suit users who have attended the new operator courses or who are confident in the use of Ion Chromatography systems and wish to carry out front line maintenance.

# HPLC Systems

## Training: New Operator Course for UltiMate 3000

### Course Outline

- A basic introduction to HPLC
  - Fluid mechanics
  - HPLC Theory
  - Method Transfer
- Understanding of the practical aspects of the instrument
  - General setup of HPLC systems
  - Familiarization with the Thermo Scientific™ Dionex™ UltiMate™ 3000
  - Instrument Control
  - Practical tips to improve system performance
- Maintenance and Troubleshooting
  - 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).

# HPLC Systems

## Training: New Operator Course for Vanquish

### Course Outline

- A basic introduction to HPLC
  - Fluid mechanics
  - HPLC Theory
  - Method Transfer
- Understanding of the practical aspects of the instrument
  - General setup of HPLC systems
  - Familiarization with the Thermo Scientific™ Vanquish™ system
  - Instrument Control
  - Practical tips to improve system performance
- Maintenance and Troubleshooting
  - 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 system.



# HPLC Systems

## LC-MS

### Training: TSQ Operations

#### Course Outline

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

This course is offered in Breda, The Netherlands. Tuition: English



# 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

# 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

We currently don't offer any iCAP 6000 and iCAP 7000 courses in our facilities in Denmark, Finland, Iceland, Norway and Sweden. However all the courses described in the brochure can be offered at customer sites. Classroom courses are currently only offered at the following facilities:

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 ICP-MS Operations

#### Course Objective:

This course covers the fundamentals of the Thermo Scientific™ iCAP™ RQ ICP-MS system 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

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### Training: iCAP TQ ICP-MS Operations

#### Course Objective:

This course covers the fundamentals of the Thermo Scientific™ iCAP™ TQ ICP-MS system 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:

- Triple quadrupole ICP-MS Fundamentals
- Interferences and solutions
- Using reactive and collisional gases
- Flatapole Technology (QCell)
- ICP-MS Analysis and Method Development
- Qualification and Performances Report
- Calibration
- Data Management and Processing
- Multi Elements and Multi-Modes Analysis
- Maintenance

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

# Training Schedule 2020

We currently don't offer any iCAPO, RQ, and TQ courses in our facilities in Denmark, Finland, Iceland, Norway and Sweden. However all the courses described in the brochure can be offered at customer sites. This also can be arranged for IOMS instruments as ELEMENT2 and ELEMENT XR, classroom courses are currently only offered at the following facilities:

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

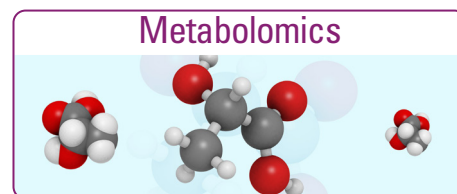
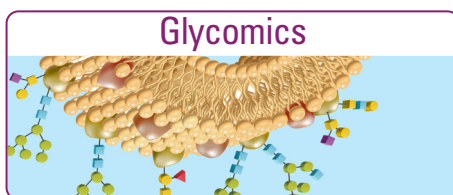
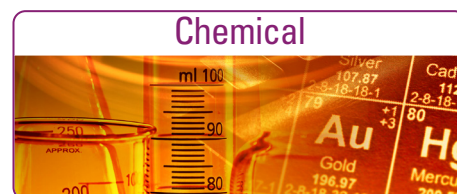
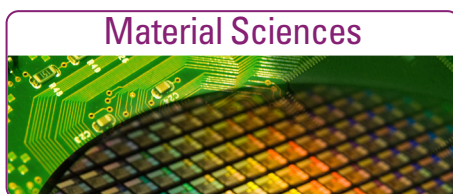
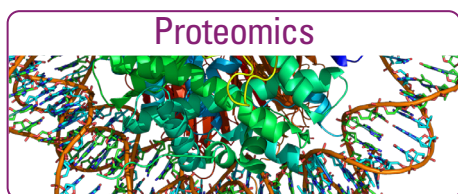
For information on training dates and tuition language, please refer to the corresponding brochure.

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# 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)

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

## Sweden:

Thermo Fisher Scientific Telefonvägen 30  
126 26 Hägersten

**Phone:** +46 8 556 468 00

**Fax:** +46 8 556 468 08

## Denmark:

Thermo Fisher Scientific  
Stamholmen

193, 2650 Hvidovre

**Phone:** +45 7023 6260

**Fax:** +45 7023 6263

## 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.

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