



# The key to your laboratory's success

2016 Training Programme UK and Ireland

# 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 2016	17
<b>Chromatography</b>	<b>18</b>
GC	19
GC-MS	20
Dionex Chromeleon Software	24
Ion Chromatography	25
HPLC Systems	26
On-Site training courses	28
Training Schedule 2016	29
<b>Trace Elemental Analysis</b>	<b>30</b>
Atomic Absorption Spectroscopy (AAS)	31
Inductively Coupled Plasma Spectroscopy (ICP-OES)	32
Training Schedule 2016	33
<b>Inorganic Mass Spectrometry</b>	<b>34</b>
ICP-MS	35
Training Schedule 2016	36
<b>Discrete Industrial Analyzers (DIA)</b>	<b>37</b>
Discrete Analysis	38
<b>Advance your Knowledge</b>	<b>39</b>
<b>How to Register</b>	<b>40</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™, Proteome Discoverer™, and SIEVE™ 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 SIEVE software programs. Information on the Thermo Scientific™ Pinpoint software can be also be included in the training course.

#### The course material includes:

- Quadrupole and Orbitrap Theory
- Quadrupole and Orbitrap Hardware
- Instrument Tuning and Calibration
- Nano-flow LC Method Development
- Data Dependent and Multiplexing Method Design
- Data Independent Acquisition (DIA)
- 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 Xcalibur and Pinpoint software packages. 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
- Xcalibur Software for Quantitative Methods
- Pinpoint Software
- Instrument Method Development
- Data Processing
- Introduction to Skyline

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™ and Fusion Lumos Tribrid 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, 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, Proteome Discoverer, and SIEVE 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
- Parallel Detection Methods
- Accurate Mass Methods
- Proteome Discoverer Software
- Basic Maintenance

This course is offered at customer site only

# 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.

---

### Training: SIEVE Software

#### Course Objective:

Thermo Scientific SIEVE software provides label-free quantitative differential expression analysis of proteins and peptides from the comparison of multiple LC/MS datasets. It is a statistically rigorous tool for analyzing data from biomarker discovery experiments. This course will allow the new user to use all modules of the software successfully. The students will become familiar with chromatographic alignment, statistical evaluation and database searching. By the end of the course they should be able to apply all software tools for their own purposes.

---

### Training: PepFinder Software

#### Course Objective:

For biotherapeutic proteins to be effective, they must be produced in biologically active forms with proper folding and post-translation modifications (PTMs).

Thermo Scientific™ PepFinder 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 PepFinder software 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 searches as well as processing Peptide Mapping raw data.

# Life Sciences Mass Spectrometry

## Proteomics

### Training: Pinpoint software

#### Course Objective:

The aim of this training course is to provide new users with the ability to use the Pinpoint software to its full potential in combination with TSQ, LTQ Orbitrap or Q Exactive data. Pinpoint software assists in the fast development of quantitative protein/peptide assays and provides a great tool for processing data from quantitative analyses. The course will cover all aspects of the identification, characterisation and quantification of biological samples, providing a complete start-to-finish workflow for biomarker ID and verification. MSn and High-Resolution/Accurate Mass (HR/AM) data as well as Selected Reaction Monitoring (SRM and iSRM) transitions data can be processed. The training content can be customized for the customer's needs and this module can also be combined with the TSQ, LTQ orbitrap and Q Exactive Biotech Operations courses on offer.

---

### Training: ProSightPC Software

#### Course Objective:

The aim of this training course is to provide new users with the ability to use Thermo Scientific™ ProSightPC software to its full potential. ProSightPC is an all round tool for identification and characterization of both intact proteins and peptides. It enables high-throughput processing of all accurate-mass MS/MS data, whether from top-down, middle-down or bottom-up experiments including the characterization of proteins with known PTMs. 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 from software setup to data reporting, including the use of the multiple search modes available to determine the exact protein sequence including modifications and alternative splicing.

---

### Training: Protein Deconvolution Software

#### Course Objective:

The aim of this training course is to provide new users with the ability to use Thermo Scientific™ Protein Deconvolution software to its full potential. Protein Deconvolution significantly improves the identification and characterization of intact proteins from mass spectrometric data. It is the only protein deconvolution software available today that takes full advantage of the ultra-high-resolution, accurate-mass data produced by Orbitrap-based mass spectrometers. 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), 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.

#### 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 Qual Browser/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

---

### Training: Metabolite Identification

#### Course Objective:

The aim of this training course is to familiarize new Thermo Scientific mass spectrometer users with optimal instrument operation and software options for performing efficient identification of metabolites. The course will cover API and MS theory, tuning, calibration, data collection and general functionality of the Xcalibur software. In addition, data processing for the purposes of metabolite identification will be performed using Thermo Scientific software packages.

#### The course material includes:

- MS Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS purposes
- Method Development
- Data Dependent Analysis and Accurate Mass Methods
- Introduction to Qual Browser/Freestyle
- Identification of Metabolites using Compound Discoverer
- Structure Elucidation using Compound Discoverer

This course is offered at customer site only

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: Structure Elucidation of Unknowns

#### Course Objective:

The aim of this training course is to familiarize new Thermo Scientific MS users with optimal instrument operation and software options for performing efficient structure elucidation of unknown small molecules such as: impurities in synthetic samples, toxic compounds, explosives, environmental components, etc. The course will cover API and MS theory, tuning, calibration, data collection and general functionality of the Xcalibur software.

#### The course material includes:

- Ion Trap and Orbitrap Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Method Development
- Data Dependent Analysis and Accurate Mass Methods
- Introduction to Qual Browser/Freestyle
- Component Detection using Compound Discoverer and m/z Cloud
- Creation and Interrogation of Libraries in Compound Discoverer and m/z Cloud
- Spectra Interpretation using Compound Discoverer and m/z Cloud

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

# Life Sciences Mass Spectrometry

## Small Molecules

### Training: SIEVE Software

#### Course Objective:

Thermo Scientific SIEVE software provides a label-free quantitative analysis of metabolic pools by comparison of multiple LC-MS datasets. It can be used to compare the metabolomes of control versus treated samples as well as from time-course experiments. This course will enable the new user to utilize all the modules of this software package in order to perform statistically valid metabolome experiments. The course topics include a familiarization with chromatographic alignments, statistical evaluation of metabolic pool sizes and exact mass database queries. By the end of the course the student will be able to apply all software tools to fulfill their experimental requirements.

---

### 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 pharmaceutical metabolism, impurity analysis, 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:

- Isotope pattern trace
- Fragment ion search trace
- Multiple mass defect filtering
- Expected compound search including dealkylation and dearylation predictions and transformation products
- Untargeted compound detection with isotope and adduct grouping
- Fragment ion search (FISh) and structure annotations
- Compare with control experiments
- 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

---

### Training: Transcend II Operations

#### 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: MSQ *Plus* Operations

#### Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ MSQ™ mass spectrometer Plus user with instrument operation including atmospheric pressure ionization, quadrupole principles, compound tuning, instrument calibration, data collection, maintenance and general functionality of the Thermo Scientific™ Dionex™ Chromeleon™ software package. The focus of this course is small molecule analysis for both qualitative and quantitative purposes.

#### The course material includes:

- MSQ Hardware Components
- Maintenance
- Tuning and Mass Calibration
- Compound Optimization and Method Development
- Quantitative SIM Analysis by Electrospray
- Quantitation using Chromeleon
- Quantitation by APCI
- Cone Fragmentation
- Qualitative Processing



# Training Schedule 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Q Exactive Operations		23-25				7-9				11-13		
TSQ Operations (Endura and Quantiva)		2-4							6-8			
Fusion Biotech Operations				5-8			5-8					
Q Exactive Biotech Operations				19-22		28-1				4-7		
Exactive Operations				26-28					27-29			
Fusion Operations			22-24						13-15			
MSQ Plus Operations			8-10									



Hemel Hempstead, tuition in English.

# 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: Trace 1300 Series GC Operations

#### Course Objective:

The aim of this course is to familiarize the new Thermo Scientific™ Trace™ 1300 Series GC user with basic instrument operation including gas chromatography theory and optimization, routine maintenance, data acquisition and data processing.

#### The training course will cover:

- Trace 1310 – General Overview
  - Oven
  - Split/Splitless Injector (SSL) & PTV
  - FID Detector & other detectors
  - Keypad familiarization
  - Removing and fitting Injector/Detector units
- Thermo Scientific™ AS/AI 1310 Series Autosampler & Thermo Scientific™ TriPlus™ Autosampler
- Gas Connections
  - Function of specific gases used
  - Carrier gas options
  - Modes of carrier gas use
  - Gas filters
- Setting up your GC
  - Column Installation
  - Detector configuration
- SSL – Principle of operation
  - Injector design
  - Split and splitless modes
  - Choice of Liner
  - Modes of operation
  - Setting the variable – flow/temperature/purges
- FID - Principle of operation
  - Cleaning the collector
  - Gas flows & make-up gas
- Sample Injection
  - Using the autosampler - programming the injection parameters
  - Manual Injection Techniques
- GC Operator Maintenance
  - Septa replacement
  - Liner replacement/changing/cleaning
  - Syringe replacement
- Chromeleon using the Trace 1300 Series GC
  - GC Configuration
  - Trace 1300 Series Gc & the Chromeleon Console
  - Method (Instrument) set-up
  - Sequence set up
  - Data processing & General reporting
- GC Troubleshooting
  - General approach to identifying, fixing and preventing system faults
- Tips & tricks

# 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 Chromeleon and TraceFinder software packages.

#### The course material includes:

- GC Theory and Optimisation (EI and CI)
- Quadrupole Theory
- GC and ISQ (LD and QD) 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 8000 Evo Operations

#### Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ TSQ™ 8000 Evo 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 TraceFinder software package.

#### The course material includes:

- GC Theory and Optimization (EI and CI)
- Quadrupole Theory
- GC and TSQ 8000 Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing with Xcalibur and Tracefinder
- Quantitative Set Up and Processing with Xcalibur and Tracefinder

# 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

# Chromatography

## GC-MS

### DFS Instrument Operator Training for Quantitative Applications

#### Course Objective:

The general objective of the Thermo Scientific™ DFS™ instrument operator training for quantitative applications is to introduce the new user to quantitative GC/HRMS techniques using dioxin/furan analysis as an example. The course will familiarize users with the operational techniques and data evaluation procedures needed for high resolution GC/MS MID methods for isotope dilution techniques, following EPA method 1613 for the analysis of Dioxins/Furans. Please note that for this course, knowledge of the EPA method 1613 or equivalent methods is required, as well as proficient understanding of mass spectrometry (MS). The participants should have experience in the field of chromatographic analysis, especially in gas chromatography.

#### The course material includes:

- Introduction into the Hardware and Basics of the DFS and General HRM
- Instrument Setup for Dioxin Analysis
- MID (Multiple Ion Detection)
- Data Evaluation using Qual Browser
- Processing Data Using Target Quan
- Generating reports using the Reporter Application

---

### DFS Dual Data Operator Training

#### Course Objective:

The general objective of the DFS Dual Data Operator training course is to introduce Dual Data acquisition for high throughput applications. For this course, a proficient understanding of mass spectrometry and DFS operation is expected. The participants should have the Dual Data option on the DFS system.

#### The course material includes:

- Introduction into the Hardware and Basics of the Dual Data Acquisition
- Instrument setup for Dual Data Analysis
- Troubleshooting and Maintenance of the Dual Data Configuration.

# Chromatography

## GC-MS

### Training: Xcalibur Software

#### Course Objective:

This course is designed to familiarize the student with the operation of Xcalibur software for use in qualitative and quantitative analysis. Detailed presentations will be given on all Xcalibur modules together with hands on exercises in order to ensure understanding of all the processes. The students will become familiar with the subjects of method and sequence set-up, data manipulation, automated processing and report generation. By the end of the course they should be able to apply all software tools for their own purposes.

---

### Training: TraceFinder Software

#### Course Objective:

TraceFinder is a software package with built-in workflows that have been developed to assist in routine analysis of environmental and food residue applications. The aim of this training course is to provide new users with the ability to use the software to its full potential. 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.

# Chromeleon Software

## Training: Introduction to Chromeleon 7.2 – 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 course has been designed for chromatographers who are new to the Chromeleon workstation or for existing users who require refresher training.

---

## Training: Next Steps in Chromeleon 7.2 – 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 course has been designed for experienced users of Chromeleon or delegates who have attended the Introductory course





# Ion Chromatography (IC)

## Training: Ion Chromatography New Operator Course

### Course Outline

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.

### Which Systems Are Covered?

Thermo Scientific™ Dionex ICS-90, Dionex ICS-900, Dionex ICS-1000, Dionex ICS-1100, Dionex ICS-1500, Dionex ICS-1600, Dionex ICS-2000, Dionex ICS-2100, Dionex ICS-3000, Dionex ICS-5000 systems.

---

## Training: Ion Chromatography Maintenance and Troubleshooting

### Course Outline

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.

### Which Systems Are Covered?

Dionex ICS-90, Dionex ICS-900, Dionex ICS-1000, Dionex ICS-1100, Dionex ICS-1500, Dionex ICS-1600, Dionex ICS-2000, Dionex ICS-2100, Dionex ICS-3000, Dionex ICS-5000 systems.

# HPLC Systems

## Training: New Operator Course for UltiMate 3000

### Course Outline

- A basic introduction to HPLC
  - Fluid mechanics
  - HPLCS 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, Ultimate 3000 RSLC (Rapid Separation) and Vanquish systems.



# HPLC Systems

## Training: New Operator Course for Vanquish

### Course Outline:

- A basic introduction to HPLC
  - Fluid mechanics
  - HPLCS 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



# 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 operations
- AutoTrace Solid Phase Extraction
- Electrochemical and CAD Detectors
- Dionex Ultimate Nano and Capillary LC Systems operatons

# Training Schedule 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Introduction to Chromeleon 7.2 – Level 1	13	10	9	13	11	8	13	10	21	5	9	14
Next Steps in Chromeleon 7.2 – Level 2	14	11	10	14	12	9	14	11	22	6	10	15
Ion Chromatography – New Operator Course		10		6		1		3		5		7
Ion Chromatography – Maintenance and Troubleshooting		11		7		2		4		6		8
ISQ Operations – Chromeleon			15-17							18-20		
ISQ Operations – TraceFinder						14-16						
Trace 1300 Series GC Operations		16-17								25-26		
New Operator Course for HPLC Systems		18-19								27-28		
TSQ 8000 EVO Operations			1-3				19-21				15-17	
MSQ Plus Operations			8-10									



Hemel Hempstead, tuition in English.



Runcorn, Tuition in English.



Paisley, tuition in English.



Dublin, tuition in English.

# 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 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
ICP-OES Operations		16-18		19-21			19-21			18-20		



Hemel Hempstead, tuition in English.

# 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 Q Operations

#### Course Objective:

This course covers the fundamentals of the Thermo Scientific™ iCAP™ Q 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™ 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 2016

<b>COURSE</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>
iCAP Q Operations	19-21		15-17			21-23			13-15		15-17	



Hemel Hempstead, tuition in English.

# Discrete Industrial Analyzers (DIA)

**Improve your productivity.** From the Thermo Scientific™ Gallery™ Automated Photometric Bench top Analyzer to the floor standing Thermo Scientific™ Aquakem™ 600 Prime, our discrete nutrient analyzers 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 and food and beverage analysis will provide you with 'hands on' instrument training using the intuitive software.



# Discrete Industrial Analyzers (DIA)

## Training: Thermo Scientific Aquakem Photometric Analyzer Systems

### 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 high throughput floor standing analyzers. 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
- 

## Training: Thermo Scientific™ Gallery™, Gallery™ Plus, Gallery™ Plus Beermaster Automated Photometric Analyzer Systems

### Course Objective:

The aim of this training course is to familiarize the new user with the principles of discrete analysis and instrument components using the bench top analyzers. 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

# 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 [www.thermoscientific.com/signup](http://www.thermoscientific.com/signup)



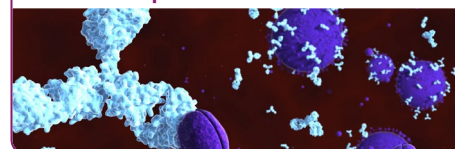
Information Systems



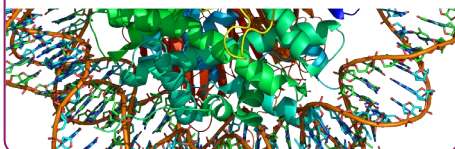
Water Analysis



Biopharmaceutical



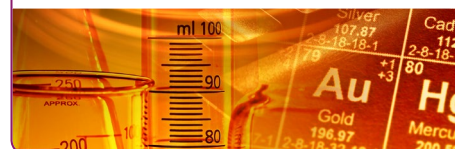
Proteomics



Material Sciences



Chemical



Environmental



Glycomics



Pharmaceutical



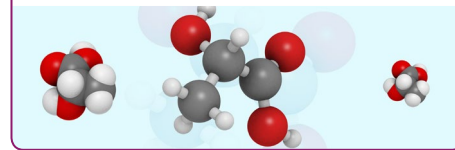
Food & Beverage Solutions



GeoSciences



Metabolomics



Clinical Research & Forensics



# 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:** + 44(0) 1442 233555

**Fax:** +44(0) 1442 233667

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

Thermo Fisher Scientific  
Stafford House  
Boundary Way  
Hemel Hempstead  
HP2 7GE  
U.K.

## 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.thermoscientific.com](http://www.thermoscientific.com)

©2015 Thermo Fisher Scientific Inc. All rights reserved. ISO is a trademark of the International Standards Organization. All other 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** +43 810 282 206

**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

**Thermo**  
SCIENTIFIC

A Thermo Fisher Scientific Brand