

# 2024 TRAINING CATALOG



# HORIBA Scientific Training Courses

HORIBA Scientific France offers many types of training courses tailored to your requirements. The courses are:

- Conducted in English, or French.
- Held at our training centers in France (Palaiseau and Lille), or at your site.

Our trainers are experts in each technique. They will provide training advice and guidance to make the most of your HORIBA Scientific instruments. Learn and share your experience with other users and acquire the basics of the technique. You will be able to directly use this knowledge for your applications in your own laboratory, and gain confidence and experience in the analysis of your samples.

Certificates are given to each attendee for every course.

## JOY AND LEARN!



## Attendance Fee

For courses taking place at our offices, the course price includes training material, lunch, and refreshments. Travel and accommodation are not included.

## Registration Deadline

We accept registrations until 4 weeks before the course begins.

## Cancellation Policy

Cancellations received four weeks prior to a course start date will be accepted with a 100% refund of the course fee. Cancellations received within 4 weeks of a course start date will receive only a 50% refund of the course fee. No refund will be given with less notice; however, we could schedule another date according to HORIBA France training planning.

We also reserve the right to cancel a course if the number of registrants does not exceed the required minimum. Cancellation notices will be sent out no later than three weeks prior to the course. A full refund of the course fee will be provided in that case. HORIBA France SAS will not be held responsible for costs incurred due to cancellation of the training course prior or on the cancellation deadline. We discourage the purchase of non-refundable tickets if airfare is required.

## Registration

To register, please submit your request on our website *The HORIBA Store* :

<https://store.eu.horiba.com>



If you have any question or need more information, contact us at [services.hfr@horiba.com](mailto:services.hfr@horiba.com)



## You've acquired a HORIBA instrument and would like to get a dedicated training? Our A la carte training courses are made for you

"A La Carte" training are tailor-made training depending on the needs and wishes of your organization. After an evaluation of your situation, we will work with you to customize your package to suit your specific needs.

For your convenience, your training can take place on site at your place of business or at HORIBA France.

Our specialized application engineers will assist you in defining the program according to your chosen instrument.

You will then be qualified to use this knowledge effectively for your applications to maximize peak performance of your equipment.



To register, please submit your request on our website *The HORIBA Store* :

[A la carte Training HORIBA](#)



If you have any question or need more information, contact us at [services.hfr@horiba.com](mailto:services.hfr@horiba.com)



## Training Calendar 2024

Ref	Duration	Training	January	February	March	April	May	June
<b>RAMAN</b>								
RAM1	3 days	RAMAN Microscopy for beginners					13-15	
RAM1PF	1 day	RAMAN Option					16	
RAM3	1 day	RAMAN Multivariate Analysis					24	
<b>AFM</b>								
AFMRAM1	3 days	Co-localized AFM-Raman and TERS			13-15			
<b>Spectroscopic Ellipsometry</b>								
ELL1	2 days + 1 optionnal	Ellipsometry Basic Level			27-29			
ELL2	2 days + 1 optionnal	Ellipsometry Advanced Modeling Techniques				3-5		
<b>Surface Plasmon Resonance Imaging</b>								
SPRI1	2 days	SPRI OpenPleX		15-16				6-7
SPRI2	4 days	SPRI Customer Training on their Applications		26-29				
<b>ICP-OES</b>								
ICP1	3 days	ICP-OES pour les débutants					21-23	
ICP2	3 days	ICP-OES Niveau avancé						11-13
ICP3	1 day	ICP Diagnostics						14
ICP4	5 days	ICP-OES						
<b>Fluorescence</b>								
FL1	2 days	Fluorescence Basic Level		15-16			30-31	
FL2	1 day	Fluorescence Software			5			10
FL3	1 day	Fluorescence LifeTime			18			17
FL4	1 day	Fluorescence Aqualog			29			24
FL5	1 day	Fluorescence Duetta				8		28
<b>PCA</b>								
PCA1	1 day	PCA : Laser Diffraction			4			
PCA2	1 day	PCA : Light Scattering Technique			15			
<b>Carbon/Sulfur and Oxygen/Nitrogen/Hydrogen Analyzers</b>								
HOR1	1 day	C/S user training course on a HORIBA analyzer						
<b>XRF</b>								
HOR2	1 day	Sulfur & Chlorine in Oil user training course on a HORIBA Analyzer						
HOR3	1 day	MESA-50 user training course on a HORIBA Analyzer						
HOR4	3 days	XGT user training course on a HORIBA Analyzer						
<b>GD-OES</b>								
GD1 (Session 1 EN)	4 days Teams + 2 days Labo	Glow Discharge Optical Emission Spectroscopy Training				9-12	29-30	
GD2 (Session 2 FR)	4 jours Teams + 2 jours Labo	Formation Spectroscopie à Décharge Luminescente						

## Training Calendar 2024

Ref	Duration	Training	July	August	September	October	November	December
<b>RAMAN</b>								
RAM1	3 days	RAMAN Microscopy for beginners			23-25		18-20	
RAM1PF	1 day	RAMAN Option			30			
RAM3	1 day	RAMAN Multivariate Analysis				7		
<b>AFM</b>								
AFMRAM1	3 days	Co-localized AFM-Raman and TERS					6-8	
<b>Spectroscopic Ellipsometry</b>								
ELL1	2 days + 1 optionnal	Ellipsometry Basic Level			11-13			
ELL2	2 days + 1 optionnal	Ellipsometry Advanced Modeling Techniques				16-18		
<b>Surface Plasmon Resonance Imaging</b>								
SPR1	2 days	SPRI OpenPleX						
SPRI2	4 days	SPRI Customer Training on their Applications			3-6			
<b>ICP-OES</b>								
ICP1	3 days	ICP-OES pour les débutants			17-19			
ICP2	3 days	ICP-OES Niveau avancé				8-10		
ICP3	1 day	ICP Diagnostics			20			
ICP4	5 days	ICP-OES			23-27			
<b>Fluorescence</b>								
FL1	2 days	Fluorescence Basic Level			19-20			
FL2	1 day	Fluorescence Software			30			
FL3	1 day	Fluorescence LifeTime				7		
FL4	1 day	Fluorescence Aqualog				21		
FL5	1 day	Fluorescence Duetta				28		
<b>PCA</b>								
PCA1	1 day	PCA : Laser Diffraction						
PCA2	1 day	PCA : Light Scattering Technique						
<b>Carbon/Sulfur and Oxygen/Nitrogen/Hydrogen Analyzers</b>								
HOR1	1 day	C/S user training course on a HORIBA analyzer			6			
<b>XRF</b>								
HOR2	1 day	Sulfur & Chlorine in Oil user training course on a HORIBA Analyzer			20			
HOR3	1 day	MESA-50 user training course on a HORIBA Analyzer			27			
HOR4	3 days	XGT user training course on a HORIBA Analyzer				2-4		
<b>GD-OES</b>								
GD1 (Session 1 EN)	4 days Teams + 2 days Labo	Glow Discharge Optical Emission Spectroscopy Training						
GD1 (Session 2 FR)	4 jours Teams + 2 jours Labo	Formation Spectroscopie à Décharge Luminescente			10-13 16-17			

# Raman Microscopy Basic Level

## Reference

RAM1

## Price

1 815€ per attendee

## Duration

3 days

## Dates

13-15 May, 23-25 September and  
18-20 November 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

13 April, 23 August and  
18 October 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Who should attend

Users of HORIBA Scientific Raman spectrometers.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on Raman spectrometers.
- Learn how to use the software.
- Learn methodology for method development and major analytical parameters.
- How to set up an analytical strategy with an unknown sample.
- How to interpret results.
- Learn how to follow the performances of the Raman spectrometer over the time.



## PROGRAM

### Day 1

**Raman basic principles.**

**Raman Instrumentation.**

**Practical session - System and software presentation, acquisition parameters:**

- LabSpec 6 presentation and environment: user accounts, file handling, data display, basic functions.
- Acquisition parameters setup and single spectra measurement.
- Templates and reports.

### Day 2

**Analysis of Raman spectra.**

**Practical session - Raman spectrum measurement and database search:**

- Parameters optimization: how to choose the laser, grating, confocal hole, laser power.
- How to use the polarization options.
- Library search using Know It All software.
- How to create databases.

**Raman Imaging:**

- How to make a Raman image (1D, 2D and 3D).
- Data evaluation: cursors, CLS fitting, peak fitting.
- Image rendering, 3D datasets.
- Fast mapping using SWIFT XS.
- DuoScan.
- Ultra Low Frequency.

### Day 3

**Data processing:**

- Processing on single spectra and datasets.
- Baseline correction.
- Smoothing.
- Normalization.
- Spectra subtraction, averaging.
- Data reduction.
- Methods.
- Practical exercises.

Customer samples: bring your own samples!

# Raman Option: Particle Finder

## Reference

RAM1PF

## Price

605€ per attendee

## Duration

1 day

## Dates

16 May and 30 September 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

16 April and 30 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated for HORIBA customer only and knowledge of the technique and equipment.

## Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

Acquire technical skills on Particle Finder.



## PROGRAM

### Day 1

#### Introduction to Particle Finder:

- Principle and requirements.

#### Practical session:

- Demo with known samples.
- Customer samples: Bring your own samples !



# Raman Multivariate Analysis

## Reference

RAM3

## Price

605€ per attendee

## Duration

1 day

## Dates

24 May and 7 October 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

24 April and 7 September 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated for HORIBA Customers only and knowledge of the technique and equipment.

## Who should attend

Users of HORIBA Scientific Raman spectrometers who already understand the fundamentals of Raman spectroscopy and know how to use HORIBA Raman system and LabSpec Software. It is advised to participate in the basic Raman training first (RAM1).

## Certification

A diploma is delivered at the end of the course.

## Learning method

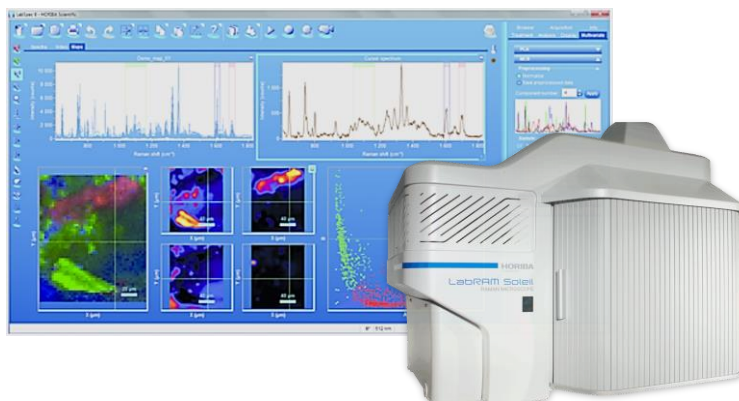
Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Understand the Multivariate Analysis module.
- Learn how to use Multivariate Analysis for data treatment.
- Perform real cases of data analysis on demo and customer data.



## PROGRAM

### Day 1

#### Introduction to Multivariate Analysis:

- Univariate versus Multivariate analysis.
- Introduction to the main algorithms: decomposition (PCA and MCR), classification and quantification (PLS).

#### Practical work on known datasets (mapping):

- CLS, PCA, MCR.

#### Introduction to classification:

- HCA, k-means
- Demo with known datasets

# Co-localized AFM-Raman and TERS



## Reference

AFMRAM1

## Price

1 815€ per attendee

## Duration

3 days

## Dates

13-15 March and 6-8 November 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

13 February and 6 October 2024

## Location

455 avenue Eugène Avinée, 59120  
Loos - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of HORIBA Scientific AFM Raman spectrometers and scientists, engineers, technicians, Ph.D. students who have already acquired good skills in Raman spectroscopy or SPM.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire practical knowledge on Raman spectroscopy and Scanning probe microscopy.
- Learn how to use dedicated Raman and AFM software.
- Learn the methodology to perform TERS measurements (alignment, macros, procedures).

## PROGRAM

### Day 1

#### Raman spectroscopy introduction:

- Basics and advantages
- Instrumentation
- Raman measurement (spectrum and map)

#### Practical Session:

- Acquisition parameters optimization: choice of the laser, grating, confocal hole, laser power etc.
- 2D Raman imaging
- Data evaluation: cursors, CLS fitting, peak fitting

#### Scanning Probe Microscopy (SPM) Introduction:

- Basics and Instrumentation
- AFM measurement (AFM imaging mode, KFM, C-AFM and Curve Force) and artefacts
- AFM tip selection

#### Practical Session:

- Tips and sample installation.
- AFM topographic imaging measurement in AC mode
- Introduction to other modes and signals (KFM, C-AFM and Curve Force)
- Practical exercises

### Day 2

#### Colocalized AFM-Raman analysis:

- Principle and examples of analysis
- Overview of the procedure

#### Practical Session:

- System configuration, getting ready for colocalized measurements
- Procedure on reference sample
- Hands-on on reference samples

#### TERS introduction:

- Principle and requirements.
- TERS prerequisites and TERS applications

### Day 3

#### Practical Session:

- Laser alignment on the tip (AFM mode)
- TERS spectrum and TERS image acquisition on reference sample (parameters optimization)
- Hands-on on reference sample.

#### Options (to be selected among the list):

- Hands-on on brought samples (AFM-Raman, TERS)
- PFM and MFM

# Ellipsometry - Basic Level

## Reference

ELL1

## Price per attendee

For 2 days 1 210€

For 3 days 1 815€

## Duration

2 days + 1 day optional

## Dates

27-29 March and 11-13 September  
2024

## Registration deadline

27 February and 11 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

New users of HORIBA ellipsometers.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instrument practice.

## Course language

English

## Objectives

- Provides a thorough background in the basic ellipsometry theory and focus on modelling techniques with a large variety of hands-on sample analysis.
- Use of the ellipsometer and DeltaPsi2 software through a large variety of hands-on sample analysis.



## PROGRAM

### Day 1

#### Theory and Practical:

- Ellipsometry theory
- Instrumentation
- Overview of modelling process
- Description of main functions of DeltaPsi2 software & hands on the ellipsometer
- Procedure to check the system before to perform measurements
- Measurement and modelling of transparent films on opaque substrates

### Day 2

#### Practical Session & Software Use:

- Sample analysis of semi-absorbing thin films in monolayers and multilayers of opaque substrate
- EMA, roughness
- Sample analysis of glass substrate
- Sample analysis of semi-absorbing thin films on glass
- Sample analysis of absorbing films
- Dispersion formulae parameterization
- Sample analysis of thickness of non-uniform layers

### Day 3 (optional)

#### Practical Session with customer samples

# Ellipsometry Advanced Modeling Techniques

## Reference

ELL2

## Price per attendee

For 2 days 1 210€

For 3 days 1 815€

## Duration

2 days + 1 day optional

## Dates

3-5 April and 16-18 October 2024

## Registration deadline

3 March and 16 September 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of HORIBA Scientific Ellipsometry spectrometers and advanced users. A level of knowledge equivalent to Level ELL1 is required.

## Certification

A diploma is delivered at the end of the course.

## Learning method

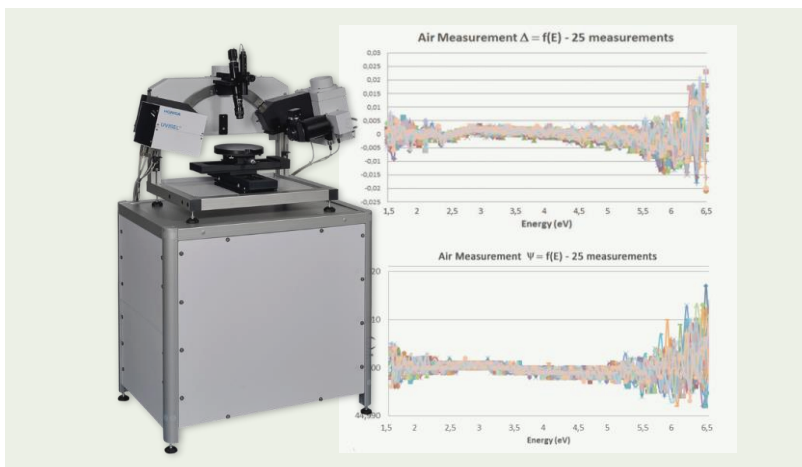
Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- This training course target advanced users, with a level of knowledge equivalent to ELL1. Attendees should have at least some ellipsometry experience and skill with DeltaPsi2 software.
- Provides a good practice of modeling methods used for the characterization of complex structures such as: unknown materials, ultra thin films, anisotropic samples, limited backside reflection parameterization, etc. Customers are invited to bring samples



## PROGRAM

### Day 1

#### Practical Session of Non-ideal Samples: Measurements and Modelling:

- Review of theory
- Analysis of gradient layer
- Analysis of thick films  $>2\mu\text{m}$
- Non-uniform thicknesses
- Study of depolarizing sample

### Day 2

#### Practical Session of Non-ideal Samples:

- Analysis of combined ellipsometric and transmission data for thin metallic films sample
- Anisotropy: learn how to identify the axis orientation to run appropriate measurements for modelling
- Instrument calibration and troubleshooting

### Day 3 (optional)

#### Practical Session with Customer Samples

# EMIA C/S Training Course



## Reference

HOR1

## Price

605€ per attendee

## Duration

1 day

## Dates

6 September 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

6 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of the HORIBA EMIA C/S analyzer.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire the knowledge to be able to choose the analytical conditions.
- Learn to optimize the instrumental parameters.
- Know how to calibrate the instrument.
- Interpret results.

## PROGRAM

### Day 1

#### Theory:

- Principle of C/S analyzers. Specificity of the EMIA
- Software presentation

#### Practical:

- Instrument checking test
- Instrument calibration
- Optimization of the analytical conditions
- Choice of accelerators and flux
- Results traceability
- First level maintenance



# Sulfur & Chlorine in Oil Training Course

## Reference

HOR2

## Price

605€ per attendee

## Duration

1 day

## Dates

20 September 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

20 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of SLFA, MESA-6000/7220.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Know how to optimize the instrumental parameters.
- Control of the analytical conditions.
- How to interpret the results.



## PROGRAM

### Day 1

#### Theory:

- Fundamentals of X-Ray fluorescence
- Specificity of sulfur and chlorine determination in petroleum samples
- Presentation of the different instruments
- Presentation of the software

#### Practical:

- Sample preparation
- Checking of the instrument
- Determination of the optimal conditions
- Calibration of the instrument
- Results interpretation
- First level maintenance

# MESA-50 Training Course

## Reference

HOR3

## Price

605€ per attendee

## Duration

1 day

## Dates

27 September 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

27 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of the Mesa 50 X-Ray Fluorescence Analyzer.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire a detailed knowledge of the principle of the MESA-50 analysers.
- Learn how to use the MESA-50 for WEEE/RoHS analysis.
- Learn how to use the MESA-50 and optimize the conditions for an unknown sample.
- Review of maintenance for optimum use of the instrument.



## PROGRAM

### Day 1

- General presentation of the XRF instruments' range.
- Principle of Dispersive X-Ray Fluorescence
- Description of the different elements of the instruments (X-Ray tube, detector, collimators, filters, camera, etc.)
- Software: complete review of different menus (depending on instruments and software version).
  
- How to run a WEEE/RoHS measurement ?
- How to run an unknown sample ?
- Qualitative and Quantitative analysis ?
- Data reporting
  
- Different examples of applications.
- Maintenance Review.
- Thickness measurements software (option).
- Sample preparation and set up.
- Accessories: Review of the different accessories and options.

# XGT Training Course

## Reference

HOR4

## Price

1 815€ per attendee

## Duration

3 days

## Dates

2-4 October 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

2-4 September 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of XGT X-Ray Fluorescence analyzers.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire a detailed knowledge of the principle of the XGT analysers.
- Learn how to perform qualitative analyses.
- Learn how to do quantitative analysis.
- Learn how to do transmission and X-Ray mappings.
- Review of the different options and their use.
- Review the maintenance for optimum use of the instrument.



## PROGRAM

### Day 1

- General presentation of XRF instruments
- Principle of Dispersive X-Ray Fluorescence
- Description of the different components of the instruments: X-Ray tube, detector, capillaries/collimators, filters, optical image, etc.
- How to analyse a sample: introduction, instrument parameters, etc.
- Qualitative analysis: instruments parameters, spectrum interpretation, etc.

### Day 2

#### Quantitative analysis:

- FPM (Fundamental Parameters Methods)
- Calibration curves
- 2 points calibration

#### Sample preparation:

- Solids (blocks, powders) and liquids

### Day 3

- Mapping: Instruments parameters and image processing
- Data processing
- Options (WEEE/RoHS, thickness measurements, Queue, LabSpecs link, particle detection)
- Maintenance review

# Fluorescence - Basic Level

## Reference

FL1

## Price

1 210€ per attendee

## Duration

2 days

## Dates

15-16 February, 30-31 May and  
19-20 September 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

15 January, 30 April and  
20 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only  
and knowledge of the technique and  
equipment.

## Who should attend

Beginners in fluorescence  
measurements.

## Certification

A diploma is delivered at the end  
of the course.

## Learning method

Theoretical presentation and  
instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on fluorescence spectrometers.
- Learn how to use the software.
- Acquire methodology for method development.
- Learn how to set up an analytical strategy with an unknown sample.
- Learn how to interpret results.
- Learn how to follow the performance of the spectrometer over the time.



## PROGRAM

### Day 1

#### Fluorescence basic principles:

- Why and where fluorescence is used. Applications review.
- Fluorescence Instrumentation – presentation of the different parts of the instrument and their roles.
- Software presentation and environment: acquisitions modules, files handling, display of data, basic functions.
- Set up of acquisition parameters and single spectra measurement.
- Review of the existing methods to estimate the Fluorescence lifetime.
- Fluorescence lifetime instrumentation – presentation of the different parts of the instrument and their role.
- Fluorescence decay analysis.
- Practical session – System and software presentation, Acquisition Parameters.

### Day 2

#### Focus on specific measurements:

- Practical session on reference and customers samples.

# Fluorescence - Software

## Reference

FL2

## Price

605€ per attendee

## Duration

1 day

## Dates

5 March, 10 June and 30 September 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

5 February, 10 May and 30 August 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Existing customers of HORIBA spectrofluorometers.

## Certification

A diploma is delivered at the end of the course.

## Learning method

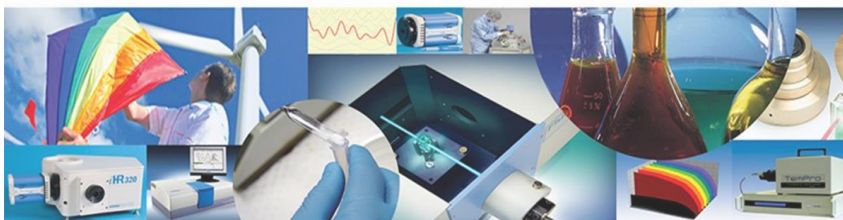
Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Learn how to use the software.
- Perform real case examples on demo and customer data.



## PROGRAM

### Day 1

- Introduction to the software
- Practical work on known datasets
- Practical work on customer data



# Fluorescence - Lifetime

## Reference

FL3

## Price

605€ per attendee

## Duration

1 day

## Dates

18 March, 17 June and  
7 October 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

18 February, 17 May and 7  
September 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only  
and knowledge of the technique and  
equipment.

## Who should attend

Beginners and intermediate users  
of HORIBA spectrofluorometers.

## Certification

A diploma is delivered at the end  
of the course.

## Learning method

Theoretical presentation and  
instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on lifetime fluorescence.
- Learn how to use the software.
- Acquire methodology for method development.
- Learn how to set up an analytical strategy with an unknown sample.
- Learn how to interpret results.



## PROGRAM

### Day 1

- Description of the technique
- Use and advantages
- Basic time-resolved measurements
- Advanced time-resolved measurements (FRET, TR anisotropy)

# Fluorescence - Aqualog

## Reference

FL4

## Price

605€ per attendee

## Duration

1 day

## Dates

29 March, 24 June and 21  
October 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

28 February, 24 May and 21  
September 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers  
only and knowledge of the  
technique and equipment.

## Who should attend

Existing customers having a  
HORIBA spectrofluorometer

## Certification

A diploma is delivered at the end  
of the course.

## Learning method

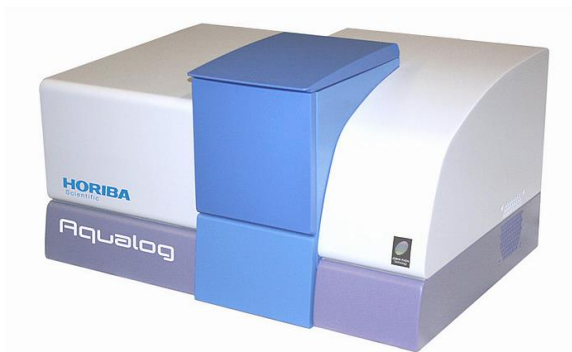
Theoretical presentation and  
instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on Aqualog fluorescence.
- Discover Excitation Emission Matrix (EEM): benefits versus the standard spectral analysis.
- EEMs applications and uses.



## PROGRAM

### Day 1

- Introduction to EEMs (Excitation-Emission Matrices)
- Data treatment: chemometrics approach
- Description of the instrument: optics, configuration
- Practical session: hands on use of the Aqualog instrument
- Parameters setup
- Data analysis

# Fluorescence - Duetta™

## Reference

FL5

## Price

605€ per attendee

## Duration

1 day

## Dates

8 April, 28 June and 28 October  
2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

8 March, 28 May and 28  
September 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only  
and knowledge of the technique and  
equipment.

## Who should attend

Users of HORIBA  
spectrofluorometers

## Certification

A diploma is delivered at the end  
of the course.

## Learning method

Theoretical presentation and  
instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on Duetta™ fluorescence.
- Discover Excitation Emission Matrix (EEM): benefits versus standard spectral analysis.
- EEMs applications and uses.
- EzSpec software applications.



## PROGRAM

### Day 1

- Introduction to EEMs (Excitation-Emission Matrices)
- Chemometrics approach
- Description of the instrument: optics, configuration
- Overview of the applications
- Practical session: hands on use of the Duetta™ instrument
- Parameters setup
- Data analysis

# ICP-OES - Niveau Basique

## Référence

ICP1

## Price

1 815€ par personne

## Durée

3 jours

## Dates

21-23 Mai et 17-19 Septembre 2024.

## Horaires

De 9h à 17h00

## Nombre de participants maximum

5 personnes

## Dates limite d'inscription

21 Avril, 17 Août 2024.

## Lieu

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prérequis

Dédiée aux clients HORIBA uniquement et avoir des connaissances de la technique ICP-OES et de l'équipement.

## Public visé

Utilisateurs de spectromètres ICP-OES d'HORIBA.

## Diplôme

Une attestation de formation est délivrée à la fin de formation.

## Méthode d'apprentissage

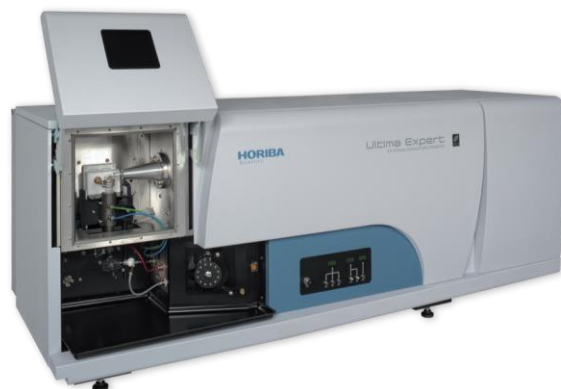
Présentation théorique et pratique des instruments.

## Langue du cours

Français

## Objectifs

- Découverte de la technique ICP-OES.
- Acquisition des connaissances théoriques et pratiques sur les spectromètres d'HORIBA.
- Maîtriser l'utilisation du logiciel (dernière version utilisée au laboratoire).
- Maîtriser la démarche de création de méthode et les paramètres.



## PROGRAMME

### Jour 1

#### Théorie et pratique :

- Théorie de l'ICP-OES - Principe et instrumentation.
- Développement de méthode: sélection des longueurs d'onde, optimisation des paramètres, interprétation des premiers résultats.
- Optimisation et création des méthodes analytiques.
- Détermination de la limite de détection.
- Effet de matrice, interférences.

### Jour 2

#### Pratique :

- Optimisation des paramètres analytiques (débit de nébulisation).
- Effet de matrice, interférences spectrales, sélection des fentes.
- Positionnement de la correction de fond.
- Analyse semi-quantitative.
- Calcul des limites de détection.
- Optimisation et création des méthodes.

### Jour 3

#### Pratique :

- Analyse d'un échantillon inconnu.
- Test des performances analytiques (LOD).
- Outil MASTER.
- Bilan et discussion.

# ICP-OES - Niveau Avancé

## Référence

ICP2

## Price

1 815€ par personne

## Durée

3 jours

## Dates

11-13 Juin et 8-10 Octobre 2024.

## Horaires

De 9h à 17h00

## Nombre de participants maximum

5 personnes

## Dates limite d'inscription

11 Mai et 8 Septembre 2024.

## Lieu

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prérequis

Dédiée aux clients HORIBA uniquement et avoir des connaissances de la technique ICP-OES et de l'équipement.

## Public visé

Utilisateurs de spectromètres ICP-OES HORIBA ayant une bonne connaissance de la technique ICP-OES et souhaitant développer des méthodes analytiques.

## Diplôme

Une attestation de formation est délivrée à la fin de formation.

## Langue du cours

Français

## Méthode d'apprentissage

Présentation théorique et pratique des instruments.

## Objectifs

- Maîtriser et savoir optimiser l'ensemble des paramètres.
- Savoir mettre en œuvre une stratégie analytique face à un échantillon.
- Interpréter les résultats.



## PROGRAMME

### Jour 1

#### Théorie et pratique :

- Rappels des paramètres instrumentaux et leur influence en ICP-OES
- Interférences en ICP-OES
- Rappel sur les méthodes analytiques applicables en ICP-OES
- Analyse de l'échantillon inconnu – analyse semi-quantitative

### Jour 2

#### Pratique :

- Optimisation et création de la méthode analytique
- Effet de matrice
- Interférences spectrales
- Sélection des fentes

### Jour 3

#### Pratique :

- Ajouts dosés
- Correction inter-élément
- Etalonnage interne
- Performances analytiques
- Bilan et discussion

**Option selon l'intérêt des participants :** génération des hydrures avec CMA , analyse des huiles.



# ICP-OES Diagnostics

## Référence

ICP3

## Price

605€ par personne

## Durée

1 jour

## Dates

14 Juin et 20 Septembre 2024.

## Horaires

De 9h à 17h00

## Nombre de participants maximum

5 personnes

## Dates limite d'inscription

14 Mai et 20 Août 2024.

## Lieu

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prérequis

Dédiée aux clients HORIBA uniquement et avoir des connaissances de la technique ICP-OES et de l'équipement.

## Public visé

Utilisateurs de spectromètres ICP-OES HORIBA.

## Diplôme

Une attestation de formation est délivrée à la fin de formation.

## Langue du cours

Français

## Méthode d'apprentissage

Présentation théorique et pratique des instruments.

## Objectifs

Suivre les performances du spectromètre ICP-OES dans le temps, identifier les dysfonctionnements, leurs sources et les résoudre.



## PROGRAMME

### Jour 1

#### Théorie et pratique :

- Paramètres critiques de l'ICP-OES
- Mise en place d'une procédure de suivi
- Interprétation des données
- Création d'une méthode de diagnostics
- Simulation de dysfonctionnement et interprétation des données
- Rappel des maintenances
- Bilan et discussion

# ICP-OES Complete Training

## Reference

ICP4

## Price

3 025€ per attendee

## Duration

5 days

## Dates

23-27 September 2024

## Schedule

From 9 am to 5.00 pm

## Maximum number of attendees

5 people

## Registration deadline

23 August 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of HORIBA Scientific ICP-OES spectrometers.

## Certification

A diploma is delivered at the end of the course.

## Learning method

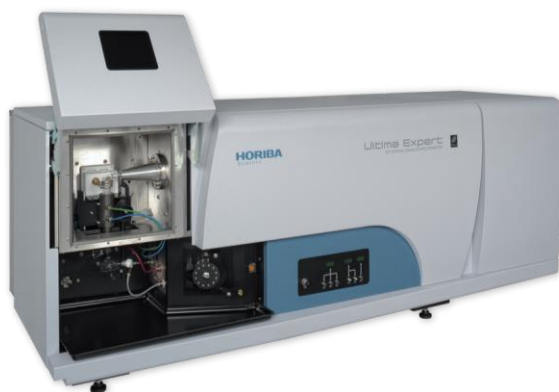
Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Theoretical and practical knowledge on ICP-OES spectrometers.
- Learn how to use the software (latest version used in the laboratory).
- Learn methodology for method development and major analytical parameters.
- Know how to set up an analytical strategy with an unknown sample.
- Interpret results.
- Follow the performances of the ICP-OES spectrometer over the time.
- Identify dysfunctions and their origins and solve these dysfunctions.



## PROGRAM

### Day 1

#### Theory:

- Theory of ICP-OES
- Principle and instrumentation
- Method development strategy
- Wavelength selection
- Optimization of parameters
- Spectral interferences
- Analytical performances

### Day 2

#### Practical - Method creation and optimization:

- Method creation
- Optimization of gas flow
- Optimization of sheath gas
- Optimization of integration time

### Day 3

#### Practical - Method creation and optimization:

- Method development
- Wavelength selection
- Semi-quantitative analysis.
- Slit selection

### Day 4

#### Practical - Analytical performance:

- Background position
- Detection limit calculation
- Spectral interferences
- Matrix effect

### Day 5

#### Analysis of unknown samples:

Result validation

# SPRi OpenPlex

## Reference

SPRI1

## Price

1 210€ per attendee

## Duration

2 days

## Dates

15-16 February and 6-7 June 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

15 January and 6 May 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

OpenPlex users or people wishing to acquire an OpenPlex.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Learn how to optimize the experimental conditions according to the interaction to be analyzed.
- Learn how to make biochip spotting.
- Master the use of OpenPlex.
- Learn how to analyze a kinetic data.



## PROGRAM

### Day 1

- Choose the right surface chemistry as a function of immobilized ligands.
- Optimize experimental immobilization conditions (spotting buffer, pH, ligand concentration, reference, duration of needle rinses / dryings, etc.).
- Master the different steps to program a spotting matrix.
- Perform spotting.

### Day 2

- Optimize the SPRi experimental conditions according to the interaction to be analyzed (buffer, temperature, duration of kinetics, flow rate, regeneration, ...).
- Master the use of OpenPlex.
- Study of a DNA / DNA interaction.
- Analysis of the data, and description of the different analysis software. Introduction to kinetics of interaction: What is a «good» kinetic?

# SPRi Training Course

## Reference

SPRi2

## Price

2 420€ per attendee

## Duration

4 days

## Dates

26-29 February and 3-6 September 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

26 January and 3 August 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

OpenPlex users People wishing to acquire an OpenPlex For this training the attendees should be from the same team.

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Learn how to optimize experimental conditions in function of interactions to analyze.
- Learn how to spot the biochip.
- Master the use of the SPRi system.
- Learn how to analyze data.



## PROGRAM

### Day 1

- How to choose the biochip according to the molecules to immobilize
- How to optimize spotting: concentrations, buffers, reference, etc.
- The important experimental parameters to be tested for SPRi: pH, running buffer, temperature, etc.
- Advices about the experiments: duration of kinetics, flow rate, regeneration, etc.
- Establishment of an experimental protocol

### Day 2

- Choose suitable surface chemistry for immobilized ligands
- Perform spotting based on the previously defined protocol
- Advices about the maintenance of the instrument

### Day 3

- Carry out the SPRi experiment as described in the protocol
- Master the use of the chosen SPRi device (OpenPlex)

### Day 4

- Reminder on interaction kinetics
- Software use
- Data analysis

# Particle Characterization Analyzer (PCA): Laser Diffraction

## Reference

PCA1

## Price

605€ per attendee

## Duration

1 day

## Dates

4 March 2024.

## Schedule

From 9 am to 5.30 pm

## Registration deadline

4 February 2024.

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users of laser diffraction analyzers  
LA 300, LA350, LA950, LA960

## Certification

A diploma is delivered at the end of the course.

## Learning method

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Acquire theoretical and practical knowledge on the particle size analyzer
- Learn how to optimize operating conditions for any sample



## PROGRAM

### Day 1

#### Laser Diffraction Theory:

- Description of optical configuration and hardware
- Fraunhofer and Mie theory
- Refractive Index (RI) definition and optimization, mathematical data treatment
- Results and interpretation (distribution base (volume, number, surface), description of typical statistical parameters (D10, D50, D90, Mode, std, D43....))
- Presentation of the unit with its different parts and accessories demonstrating associated applications.

#### Software:

- Installation
- Software description for quick handling
- How to create method and check reference materials
- How to create a standard method
- Method set up on customer samples
- Importance of sample preparation (sampling, sample pre-dispersion)

#### Choice of Analytical Conditions and Optimization:

- Pump speed/stirrer speed (wet mode), Pressure / feeder vibration (dry mode).
- Acquisition time.
- Concentration.
- Ultrasonics: internal/external use.
- Refractive index optimization.
- Results interpretation (fit optimization, right size parameters selected regarding sample distribution, etc.).

#### Data exportation and setup

#### Specific software functions

#### Hands-on with Common Samples such as:

- Colored samples.
- Dense materials.
- Polydisperse & multimodal samples.
- Granulated formulations / friable samples.
- Emulsions.

#### Maintenance of First Level



# Particle Characterization Analyzer: Light Scattering Technique

## Reference

PCA2

## Price

605€ per attendee

## Duration

1 day

## Dates

15 March 2024

## Schedule

From 9 am to 5.30 pm

## Registration deadline

15 February 2024

## Location

14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prerequisites

Dedicated to HORIBA customers only and knowledge of the technique and equipment.

## Who should attend

Users equipped with a DLS and ELS analyzer.

## Certification

A diploma is delivered at the end of the course.

## Learning methods

Theoretical presentation and instruments practice.

## Course language

English

## Objectives

- Learn how to set up good conditions to properly run a sample
- How to interpret results in DLS and ELS



## PROGRAM

### Day 1

#### Dynamic Light Scattering Theory:

- Principle of the technique, optical configuration and hardware description
- Parameters necessary to set up and influence results
- Cumulant and histogram methods
- Results and interpretation: distribution base (intensity, volume, number), description of typical statistical parameters (Zave, PI, mean size, mode, std)
- Zeta potential principle (DLVO approach)
- Henry equations (models available: Schmolukovski, Huckel...).
- Molecular weight measurement (Debye plot).
- Presentation of the unit with its different parts, accessories and their associated applications.

#### Software:

- Installation and description for quick handling
- How to create method and check reference materials
- How to create a standard method
- Method set up on customer samples
- Importance of sample preparation

#### Choice of Analytical Conditions and Optimization:

- Media RI and viscosity set up
- Detector angle selection / attenuation filters
- Correlator set up
- Measurement acquisition time
- Model of computation
- Result display configuration: intensity base, volume base, etc.
- Results interpretation: fit optimization, and data evaluation and treatment
- Data exportation and setup, and re-computation

#### Hands on with common samples such as:

- Diluted and concentrated samples
- Broad size distribution samples
- Very small sample sizes (< 10nm)
- Proteins approach
- Emulsions
- Powders approach

#### First level maintenance

# Glow Discharge Optical Emission Spectroscopy

## Reference

GD1

## Module 1

**Duration:** 4 sessions of 2h30

**Dates:** 9, 10, 11 and 12 April 2024

**Schedule:** 10 am to 12.30 pm  
(France time zone; UTC+2 )

**Prerequisites:** dedicated to HORIBA customers only.

**Location:** online via Teams

## Modules 2

**Duration:** 2 days

**Dates:** 29 and 30 April 2024

**Schedule:** 9 am to 5 pm

**Prerequisites:** dedicated to HORIBA customers only and to have completed Module 1

**Location:** 14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Price per participant

**Module 1 only:** 495 €

**Modules 1 & 2 :** 1650 €

## Objectives

- Make full use of the software
- Know how to optimize instrument parameters and analysis modes
- Carry out measurements of various types of samples
- Master volume and surface calibration
- Know the accessories
- Know how to perform a diagnosis of the instrument

## Learning methods

The trainer adapts the course program according to the questionnaires received. The group is 6 people maximum to promote practice and exchanges.

## Certification

A diploma is delivered at the end of the course.

## Course language

English



## PROGRAM

### Module 1 (Online Training on Microsoft Teams)

#### Overview of the GD technique, instrument and software:

- Full command of the software
- Operating in simulation mode
- Export/Import. Data transfer
- Examples of measurements and operating conditions
- Principles of optics and Spectroscopy
- GD plasma and interaction plasma/ samples
- Pulsed mode and synchronized pulsed mode
- Principles of calibration
- Particularities of surface calibration
- Samples selection
- Principles of DIP (Differential Interferometry Profiling)
- Various analysis modes
- Accessories overview

### Module 2 (Face-to-face training at HORIBA France Palaiseau site)

#### Functioning and use of the hardware and software:

- Daily verification procedure
- Analysis of different samples and data processing
- Optimization of the instrument operating conditions
- How to use the pulsed mode and the synchronous pulsed mode
- How to use the monochromator and image mode
- Calibration optimization

#### Presentation of specific functions and accessories:

- UFS and other plasma gases
- Plasma cleaning
- DIP (Differential Interferometry Profiling)
- Different accessories

#### Maintenance

# Spectrométrie à Décharge Luminescente

## Reference

GD2

## Module 1

**Durée:** 4 sessions de 2h30

**Dates:** 10, 11, 12 et 13 Septembre 2024

**Horaires:** de 10h à 12h30

**Prérequis:** dédiée aux clients HORIBA uniquement.

**Lieu:** en ligne via Teams

## Modules 2

**Durée:** 2 jours

**Dates:** 16 et 17 Septembre 2024

**Horaires:** de 9h à 17h00

**Prérequis:** dédiée aux clients HORIBA uniquement et avoir suivi le Module 1.

**Lieu:** 14 Boulevard Thomas Gobert,  
91120 Palaiseau - France

## Prix par participant

**Module 1 seul:** 495 €

**Modules 1 & 2 :** 1 650 €

## Objectives

- Utiliser complètement le logiciel
- Savoir optimiser les paramètres instrumentaux et les modes d'analyse,
- Réaliser la mesure de divers types d'échantillons,
- Maîtriser l'étalonnage en volume (bulk) et en surface
- Connaître les accessoires,
- Savoir effectuer un diagnostic de l'instrument.

## Moyens pédagogiques

Le formateur adapte le programme de formation en fonction des questionnaires reçus. Le groupe est de 6 personnes au maximum afin de favoriser la pratique et les échanges.

## Certification

Un diplôme est délivré à la fin du cours.

## Langue du cours

Français



## PROGRAMME

### Module 1 (Formation en distanciel par Teams)

#### Présentation générale de la technique GD, de l'instrument et du logiciel :

- Opération en mode simulation
- Export/Import. Echange de données
- Exemples de mesure et conditions opératoires
- Principes Optique et Spectrométrie
- Plasma GD et interaction plasma/ échantillons
- Mode pulsé et mode pulsé synchrone
- Principes de l'étalonnage
- Spécificité de l'étalonnage en surface
- Choix des échantillons
- Principe du DIP
- Divers modes d'analyse
- Présentation des accessoires

### Module 2 (Formation en présentiel sur le site de Palaiseau)

#### Fonctionnement et utilisation du Logiciel :

- Procédure de vérification journalière
- Analyse d'échantillons divers et traitement des données
- Optimisation des conditions opératoires
- Utilisation du mode pulsé et du mode pulsé synchrone
- Utilisation du monochromateur et mode image
- Optimisation des étalonnages

#### Présentation de fonctions et accessoires spécifiques :

- UFS et autres gaz plasmas
- nettoyage plasma
- DIP
- Accessoires divers

#### Maintenance