

GC & GC-MS Training

Comprehensive - Affordable - Instrument Independent

Scheduled – Tailored – Bespoke – Onsite – Offsite – Our Training Venue

Theoretical - Hands-on - Hardware - Software - Technique

Method Development - Application - Maintenance - Troubleshooting



UK
Ireland
Europe
Middle East
Africa
America
and beyond



Anthias Consulting Ltd
Bridging the Gap

Who are we?

Based in Cambridgeshire, UK, Anthias Consulting Limited are experts in the separation sciences in the fields of Gas Chromatography (GC), Mass Spectrometry (GC-MS) and other analytical techniques including liquid chromatography.

We provide a range of services in consulting, instrument training, demonstrations and applications, method development and optimisation and technical authoring for instrument manufacturers, analysts and technology companies from small, independent laboratories and academic institutions to multi-national corporations.

We provide training to “bridge the gap”, bringing experience of all aspects of the customer: supplier interface from both sides, providing an insight into the needs of each. We work with both the analysts who use the GC instrumentation and the instrument manufacturers, by providing both generic, manufacturer or software specific, theoretical, hardware, software, method development, maintenance and troubleshooting training and consultancy enabling you to get the best out of your analytical systems.

Our expertise lies in Gas Chromatography (GC, GCxGC), Mass Spectrometry (MS, TOFMS) and related techniques, including: Large Volume Injection (LVI), PTV, Selective Discrimination, Thermal Desorption (TD), Pyrolysis (Py), Headspace (HS), Solid Phase Extraction (SPE), Solid Phase Micro-extraction (SPME) and automated sample preparation. In addition, we provide expertise and training in Liquid Chromatography (LC) and LC-MS. Our knowledge and experience can be applied to any scientific instrument.

Diane Turner is the Founder and Director of Anthias Consulting. A Warwick University Graduate, Diane started her career as an Analytical Chemist, later gaining significant experience as an Applications Chemist. Diane has developed methods for, given support and high quality training for companies in most industries around the world for the past 18 years. Diane's area of research is disease diagnosis at The Open University through her PhD studies. Diane is an elected member of the Royal Society of Chemistry Analytical Division Council.

Imran Janmohamed gained extensive experience in his doctoral studies in the use of GC, GC-MS and GCxGC-ToFMS for the analysis of trace-level contaminants in the environment. You will find him organising, running and teaching our classroom and laboratory-based courses at The Open University in Milton Keynes.

Richard Stokes joined Anthias Consulting in 2015 in the role of Consultant and Trainer. Richard holds a BSc (Hons) degree in Chemistry and an MSc in Analytical Chemistry. Richard has over 20 years' experience in GC-MS and other analytical methodologies largely gained from work within food and environmental contract laboratories. Several senior operational roles have fostered a keen interest in method miniaturisation using GC-MS and other techniques.

email: sales@anthias.co.uk phone: +44 (0)1480 831262



Why choose Anthias?

Training covers the full expanse of Gas Chromatography, GC-MS and related techniques

Independent - guaranteed non-sales environment and unbiased advice

Flexible training - classroom or lab-based; theoretical and/or hands-on; generic or manufacturer specific;

Training can be scheduled or tailored to meet your exact needs; onsite or offsite; UK, worldwide or online

Training has a strong practical and application focus, with lots of tips

Maximum class sizes to encourage participant interaction but provide focused support for your needs

Taught by practicing analytical chemists with 50 years combined experience and current skills

Plenty of opportunities to ask questions tailored to your needs

Training available for all levels of experience – from complete beginner to advanced techniques

web: www.anthias.co.uk Twitter: @anthiasconsult

Courses approved by the Royal Society of Chemistry

Hundreds of attendees from a range of backgrounds successfully trained over the past 12 years

Presented in English with visuals and props for clarity and instrument parts & consumables

Price includes training manual, lunch and refreshments

Prestigious training facility at The Open University

Discounts available for early bird, student, professional body members and group bookings

Partnering worldwide with universities and research institutes to host our training courses

A certified WBE with WEConnect, helping you to meet your supplier diversity policies

Applications training including Metabolomics

LC & LC-MS training and consultancy also available



Training Solutions

We currently offer different types of training:

1. **Generic classroom-based theoretical training courses with practical focus**
2. **Generic laboratory based hands-on training courses**
3. **Manufacturer and software specific training courses**
4. **Scheduled onsite or offsite**
5. **Completely Bespoke or Tailored**

Techniques

We currently offer training in these techniques:

1. **GC & GC-MS**
2. **LC & LC-MS**
3. **ICP-OES & ICP-MS**
4. **Spectroscopy techniques**

For further details of non-GC and other analytical techniques please visit www.anthias.co.uk

Booking

Scheduled Courses

For the latest calendar and details of venues, please visit www.anthias.co.uk. Reserve your place on the courses by completing an online registration form on our website, or requesting a form by sending an email to sales@anthias.co.uk.

After your booking is confirmed, you will be sent a pre-course questionnaire, instructions on course venues, local hotels, airlines and course venue directions.

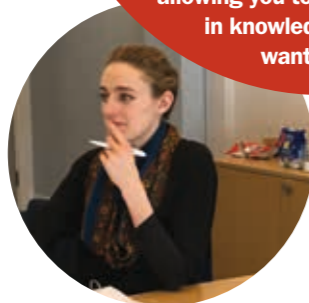
We also offer these scheduled courses onsite or offsite depending on your requirements. Anthias can tailor training courses to suit your company's needs or provide completely bespoke training.

For full Terms and Conditions please visit our website.

What is a hands-on course?

A hands-on course mixes 50:50 theory and hands-on practicals in a laboratory environment. Small groups of a maximum of 4, allow every individual's needs to be met and half of your time will be spent in the laboratory.

The knowledge you will gain spans both GC and MS and can be applied to both. You can mix and match hands-on courses to meet your exact requirements, allowing you to bridge the gaps in knowledge that you want to fill.



 Book Now!

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Training Venues

Your Laboratory

Anthias offers completely bespoke and tailored training which enables practical exercises to be taught on your instrumentation.

The Open University

Anthias Consulting is very proud of its partnership with The Open University. Anthias Consulting's training facility is hosted by Dr Geraint (Taff) Morgan within the School of Physical Sciences at The Open University in Milton Keynes, UK. Here, we can offer offsite training of our scheduled courses as well as completely bespoke and tailored options.

Hosting Venues

Anthias Consulting works with a range of prestigious academic and corporate venues in hosting its courses including: University of Glamorgan, Imperial College London, Liverpool University, Newcastle University, Nottingham University, Plymouth University, York University, MSD a subsidiary of Merck & Co., and the Emirate of Abu Dhabi National Rehabilitation Centre in the UAE. Anthias is always open to working with appropriate venues both nationally and internationally for hosting arrangements. Please contact us at courses@anthias.co.uk to discuss the opportunity.

Courses Organised by our Partners

Anthias consulting works closely with our partners to offer scheduled training courses around the world.

- **EireChrom – Ireland**
- **Hichrom – UK**
- **JSB – UK and Europe**
- **Tectron – Kuwait**

web: www.anthias.co.uk LinkedIn: Anthias Consulting Ltd.

Course Accreditation



The majority of Anthias scheduled courses have been given formal approval by the Royal Society of Chemistry for CPD under their training course approval scheme.

According to Katie Dryden-Holt, the Royal Society of Chemistry's Accreditation Development Specialist: "The objectives of course approval are to highlight good quality training available to the community and encourage members' continuing professional development [CPD] while also supporting trainers to promote their courses globally. The approval process is one of peer review, involving assessment against set criteria by members that are experts in their field."

We are working closely with the RSC, helping them deliver training to their Pan Africa Chemistry Network (PACN) and collaborating with them on our first book.

All of our approved courses can be found on the Royal Society of Chemistry's searchable database:

www.rsc.org/cpd/training

and on the anthias website:

www.anthias.co.uk/gc-training

RSC Members receive a Discount of 15% for 2, 3, 4, or 5-day training courses approved by the RSC or 10% for any other 2, 3, 4 or 5-day course.

ChromSoc members receive a discount of 10% for any 2, 3, 4 or 5-day course.



Generic classroom-based courses

These vary from 1 to 5 days and allow attendees to boost their knowledge, confidence and results in all aspects of gas chromatography and GC-MS. The courses have a strong focus on the practical side of the techniques rather than purely theoretical, which can be applied the instant you return to your laboratory. Although there will be a use of 'props' (instrument parts and consumables) within these courses for you to get a feel of and you'll be presented with lots of tips and tricks, there will NOT be any hands-on aspects to the courses within the laboratory environment.

Absolute Basics of GC & GC-MS (1 day)

Audience: Absolute beginners in gas chromatography and GC-MS. The what, how, why, where and when of GC & GC-MS. This course covers the absolute basics and is a good starting point for beginners with no GC experience, prior to attending the Practical Essentials, Complete, Complete Hands-on or Manufacturer specific courses. Topics covered (to basic level) include:

- **Instrumentation**
- **Sample types**
- **Analytes**
- **Chromatograms**
- **Analytical columns**
- **Stationary phases**
- **Mobile phases**
- **Separation process**
- **GC oven**
- **Sample introduction**
- **On-column injections**
- **Split & splitless injections**
- **Detection**
- **Flame ionisation detector (FID)**
- **Electron capture detector (ECD)**
- **Mass selective detector (MSD)**
- **Qualitative data analysis**
- **Quantitative data analysis**
- **Sampling techniques**
- **Applications**

Practical Essentials of GC & GC-MS (3 days)

Audience: Intermediate level, some experience of GC or GC-MS is required or participants have attended the Absolute Basics of GC & GC-MS course. Topics covered include:

Day 1	Day 2	Day 3
Introduction to GC & MS	Analytical columns & column flow	Data analysis: Libraries, Qualitative, Quantitative & Semi-quantitative analysis
Carrier gases & plumbing	Pre-columns & backflushing	Sampling, automation & derivatisation
Gases & plumbing	Detectors: FID, TCD, ECD, etc.	Thermal desorption, Pyrolysis
On-column, split & splitless injections	MS: vacuum, ionisation, mass analysers & ion detectors	Solid-Phase Extraction, SPME, SBSE
Large volume injection (LVI)	Quadrupole, ion trap, TOF, MS/MS, QQQ, magnetic sector	Headspace - static & dynamic, Purge & Trap
Gas sampling valves	Scan, SIM, SIR & MS/MS	Liquid-Liquid Extraction



“Comprehensive; informal presentation; opportunity to ask questions as we went along. Most interesting topic: Fundamentals of GC. Most useful topic: Sample preparation.”

Carolyn Willis, Research Director, Amersham Hospital attended the Absolute Basics course

The GC & GC-MS Clinic (2 days)

Audience: Advanced level, good knowledge of GC or GC-MS is required or participants have attended the Practical Essentials of GC & GC-MS course. Topics covered include:

Day 1 (4)	Day 2 (5)
Method development and optimisation	Maintenance: from septa to liners to pumps & detectors to MS tuning to contamination
Case studies: Choosing instrumentation & techniques, developing methods	Identifying when maintenance is required
Validation & accreditation	Troubleshooting: Preparing for problems
Advanced techniques taster (basic level): Mass spectral interpretation	Identifying problems
Selective discrimination	The troubleshooting process
Deconvolution, Chemometrics	Exercises: troubleshooting chromatograms
Multi-dimensional GC (GCxGC, heartcutting)	

The Complete GC & GC-MS (5 days)

Audience: Intermediate level, GC or GC-MS users who wish to learn the techniques then continue on to develop methods and troubleshoot instruments. Complete beginners are advised to attend the Absolute Basics of GC & GC-MS first.

Topics: This course consists of the 3-day Practical Essentials of GC & GC-MS and the 2-day GC & GC-MS Clinic courses. Placed back to back, analysts can attend both courses at once, or alternatively, go away and implement the Practical Essentials, then come back for the 2-day GC & GC-MS clinic at a later date.

Individual days: You can also choose to attend a single day from the 5 days listed to brush up your knowledge on a particular topic,

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however it is advised to attend the full course or at least the Practical Essentials of GC & GC-MS to attend days 4 or 5.

Mass Spectral Interpretation (3 days)

Audience: Advanced level, for those who have a good background in organic chemistry and at least six months experience using GC-MS.

Topics: You will learn the fundamentals of mass spectral interpretation for the identification of unknowns or to enhance your understanding of fragmentation patterns produced from GC-MS analysis to aid in accurate identification when using library search programs.

This course includes a large proportion of practical exercises interpreting mass spectra.



“Getting help with niggly issues and questions that I haven't been able to find answers to.”

*Rebecca Nichols
- GC Analyst, Veolia*



Generic laboratory-based courses

These courses vary from 1 to 5 days and cater for those eager to combine theory with practice. They are a mixture of classroom-based presentations with hands-on hardware training within the laboratory environment and software training within the lab and/or classroom. Our “hands-on” courses all have 50% of the time spent in the laboratory using the instrumentation.*

Hands-on Complete GC & GC-MS (5 days)

The Hands-on Complete GC & GC-MS course is made up of the 5 individual days of the Hands-on Gas Chromatography Theory & Methods, GC Maintenance, Gas Chromatography-Mass Spectrometry Theory & Methods, GC-MS Maintenance and GC & GC-MS Troubleshooting courses. Taken all together they provide you with a Hands-on Complete overview of GC and GC-MS theory, methods, maintenance and troubleshooting. You can also take a 2-day or 3-day course focusing on just the GC or just the GC-MS.

Hands-on Sample Preparation (5 days)

The Hands-on Sample Preparation Course Combines the 5 individual hands-on sample preparation days covering Headspace, SPME, Thermal Desorption, Pyrolysis and Purge & Trap.

Hands-on Advanced Injection Techniques (2 days)

This course combines the 2 advanced GC courses on Hands-on Multi-Mode Inlets (MMIs) & Programmable Temperature Vapourisers (PTVs) and Large Volume Injection (LVI). This course will enable you to learn about and practice some advanced and powerful GC techniques which could be very useful for your analysis.

Hands-on Gas Chromatography (1 day)

Spend the first part of the day learning the theory of gas chromatography and then use this knowledge to create split and splitless methods, perform manual and liquid autosampler injections and change oven temperature programs to optimise the separation of analytes detected with an FID.

Hands-on GC Maintenance (1 day)

This one day course combines learning the reasons why maintenance is required, what happens if maintenance isn't performed and the signs of when maintenance is needed along with practicals carrying out maintenance on a gas chromatograph.

Hands-on Gas Chromatography-Mass Spectrometry (1 day)

Spend the first part of the day learning the theory of mass spectrometry and then use this knowledge to create GC-MS methods, perform injections and change MS parameters to see the effects.

Hands-on GC-MS Maintenance (1 day)

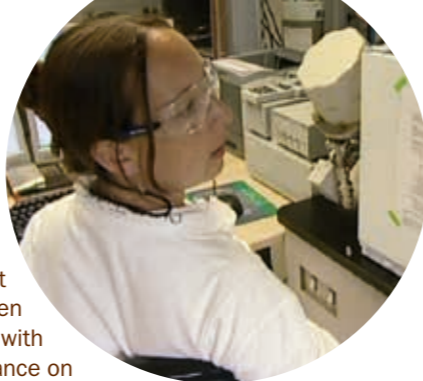
This one day course combines learning the reasons why maintenance is required, what happens if maintenance isn't performed and the signs of when maintenance is needed along with practicals carrying out maintenance on mass spectrometers.

Hands-on GC & GC-MS Troubleshooting (1 day)

This one day course combines learning how to go about troubleshooting a GC or GC-MS instrument and what problems can occur, with real problem solving on the instruments and data analysis software.

Hands-on Headspace (1 day)

Spend part of the day learning the theory of static and dynamic headspace and how to modify samples to improve results, then use this knowledge to create HS methods, analyse samples and experiment with parameters to see the effects.



Hands-on SPME (1 day)

Spend part of the day learning the theory behind Solid-Phase Micro-Extraction and how to modify samples to improve results, then use this knowledge to create SPME methods, analyse samples and experiment with parameters to see the effects.

Hands-on Thermal Desorption (1 day)

This one day course begins with the theory of thermal desorption, types of samples that can be analysed using this technique, types of tube packing materials and how to collect samples. This knowledge is then used to create TD methods, collect and analyse samples and experiment with parameters to see the effects.

Hands-on Pyrolysis (1 day)

Spend part of the day learning the theory behind the different pyrolysis techniques and then put this knowledge into practice in the laboratory, creating pyrolysis methods, analysing samples and changing parameters to see the effects.

Hands-on Purge & Trap (1 day)

This one day course is spent learning the theory of purge-and-trap (P&T) and how to modify samples to improve results, then using this knowledge to create P&T methods, analyse samples and experiment with parameters to see the effects.

Hands-on Multi-Mode Inlets (MMIs) & Programmable Temperature Vapourisers (PTVs) (1 day)

This one-day training course focuses on the different sample introduction and injection techniques that can be used with Programmable Temperature Vapourisers (PTVs), Multi-Mode Inlets (MMIs), Cooled and Universal Injection Systems. The course will cover hot versus cold split and splitless injections; cool on-column injection (COC); large volume injection (LVI); thermal desorption (TD); pyrolysis; and in-liner derivatisation injection techniques.

This is a generic course for these advanced inlets that is applicable to many different manufacturers, including GL Sciences OPTIC, GERSTEL CIS, Thermo PTVs, Varian PTVs, Agilent PTV & MMI, Shimadzu OCI/PTV and JAS UNIS.

Hands-on Large Volume Injection (1 day)

This one day course combines the theory and advantages behind the different large volume injection techniques with “hands-on” practicals to create, use and optimise LVI methods in the laboratory.

Hands-on GCxGC Operator (2 days)

The 2-day Hands-on GCxGC Operator course is designed to introduce the fundamental concepts of GCxGC using thermal or flow modulation with the operation of the Zoex or Leco thermal modulator or the Agilent CFT flow modulator and the Zoex GCImage or Leco ChromaTOF software. It combines a mixture of classroom based presentations with hands-on software and hardware laboratory exercises to give you comprehensive training.

If you would like to improve your knowledge in a particular area and don't want to attend a long course you can choose to attend individual days from the Hands-on Complete GC & GC-MS, Hands-on Sample Preparation and Hands-on Advanced Injection courses.

“Really informative. Knowledgeable and enthusiastic trainer (good stories, examples, experiences). Small group and thus a lot of personal attention. All very interesting!”

Lydia Bossers, University of Glamorgan. Complete course.



Manufacturer & software specific courses

These courses were specially developed in response to our participant's feedback who wanted to have hands-on experience in the use, maintenance and troubleshooting of specific GC and GC-MS instruments or software, along with the essential theory that we previously offered. It will significantly improve your knowledge and learning through the practicals that we run. These courses vary from 2 to 5 days and cater for those eager to combine theory with practice and mix classroom-based presentations with hands-on hardware and/or software within the laboratory and/or classroom. These courses can be offered at The OU or on-site.

Comprehensive GC Training (4 days)

This course can take place on a range of different manufacturers' instrumentation.

- Agilent GC hardware with OpenLAB Chemstation or EZChrom software
- PerkinElmer GC hardware with TurboChrom or TotalChrom software
- Shimadzu GC hardware with GCSolution software
- Thermo GC hardware with Xcalibur or Chromeleon software
- Varian/Bruker GC hardware with Galaxie or Star software

Comprehensive GC Training (2 days)

- SRI GC Hardware with PeakSimple software

Comprehensive GC-MS Training (5 days)

- Agilent SQMS hardware with MassHunter software
- Agilent QQMS hardware with MassHunter software**



Comprehensive GC-MS Training (4 days)

This course can take place on a range of different manufacturer's instrumentation.

- Agilent GC-MS hardware with MSD Chemstation or MassHunter** software
- PerkinElmer GC-MS hardware with TurboMass software
- Shimadzu GC-MS hardware with GCMSsolution software
- Thermo GC-MS hardware with Xcalibur software
- Varian/Bruker GC-MS hardware with MS Workstation software

Carrier Gas Flow Management (Agilent CFT) (1 day)

This course mixes classroom and laboratory training and is designed for those who want to enhance their skills in the use of Agilent CFT devices, like the purged and non-purged Agilent splitters, QuickSwap and optimized Tee systems to manage their carrier gas flow through the GC system, including backflushing and splitting.

Introduction to Heart-cutting (Agilent Deans Switch) (1 day)

This course is designed to introduce the fundamental concepts of GC+GC with the operation of the Agilent Deans Switch flow modulator. It combines a mixture of classroom based presentations with hands-on software and hardware lab exercises to give you comprehensive training.

Basics of Deconvolution (AMDIS) (1 day)

This course introduces the fundamental concepts of spectral deconvolution, using AMDIS software to demonstrate the theory.

Applied Deconvolution (AMDIS) (2 days)

This practical software course on the powerful Automated Mass Spectral Deconvolution and Identification System software mixes 50% presentations with 50% practical exercises using the software to get a good grasp of its capabilities in performing deconvolution to process your GC-MS data.

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GCxGC Data Handling (Zoex GCImage) (2 days)

Run in conjunction with JSB who provide the software, you will focus on the theory and advantages of comprehensive multi-dimensional gas chromatography using either thermal or flow modulation and then you can experience the power of GCxGC(-MS) by analysing and experimenting with some previously acquired data using GC Image software.

Basic ACD/Labs (Spectrus Processor and DB) (2 days)

This basic course teaches you how to use the powerful ACD/Labs software focusing on the ACD/Labs Spectrus Processor and Spectrus DB. We will present the two main workflows of the software in performing identification & deconvolution of your GC-MS data. If you have complex samples, learn about using your analytical resolution with mass spectral deconvolution to unravel your mixed mass spectra.

Advanced ACD/Labs (2 days)

In this advanced course you will learn the advanced tools within the ACD/Labs software. You will be reviewing the ACD/Labs Spectrus Processor and Spectrus DB advanced features, along with the setting up of the software from default settings.

Chemometrics

Absolute Basics of Chemometrics (1 day)

- Method Optimisation
- Environmental Analysis
- Biomarker Discovery
- Flavour & Fragrance Analysis

This course provides an introduction to chemometric techniques and their applications in different fields such as clinical, environmental and biotechnology applications as well as for method development.

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For other hardware and software please enquire by email sales@anthias.co.uk or telephone +44 1480 831262

Data analysis using chemometric techniques (Agilent MassHunter with GeneSpring Mass Profiler Professional) (4 days)

This 4-day course introduces the integrated set of software packages available to analysts performing studies using Agilent based mass spectrometry platforms.

Bespoke & Tailored Training

If you have several members of staff requiring training we can deliver one of our scheduled courses just for your company. Or, we can tailor one or more courses to match your training requirements.

Tailored training: our training courses are modularised, making it easy to put together a tailored course that is flexible in the length of time, level and depth of topics covered to meet the needs of your company, your current or future instrumentation and the knowledge of your analysts.

Bespoke training: our complete course provides training on all GC & GC-MS techniques and our manufacturer-specific courses provide training on most manufacturer's hardware and software. However, we are frequently asked to provide training that is beyond the scope of our current offerings and we are very happy to do so! This can include applications training as well as theory, hardware or software on very specific techniques and instrumentation.

Whatever your training requirements are, we can deliver our scheduled, tailored and bespoke training:

- Onsite using your instrument, samples, methods and data.
- Offsite at our facilities at The Open University, just for your company!

Please get in touch with us to discuss your training and consultancy needs.



**“ Very
informative,
course instructor
has great
knowledge.”**

*Vanja Jurisic, University
of Zagreb Faculty of
Agriculture*

**“ Very
informative
with no sales
“gimics” unlike
some manufacturers’
courses.”**

*Alison Kuhl, University of
Bristol Hands
on SPME*

**“ Clear
explanation
of every Thermal
Desorption aspect.
Very useful tips
and tricks.”**

*Ward D’Autry, DSM Resolve
Bespoke Hands-on
Thermal Desorption*

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analytical techniques, or our consultancy, go to:

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