

Analytical quality training programme



Training course calendar 2018

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February

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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

March

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18	19	20	21	22	23	24
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April

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29	30					

May

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27	28	29	30	31		

June

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July

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29	30	31				

August

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September

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30						

October

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November

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December

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23	24	25	26	27	28	29
30	31					

- Statistics for analytical scientists
- Further statistical tools for analytical scientists
- Designing effective experiments
- Using Excel spreadsheets for data analysis in testing laboratories
- Evaluating measurement uncertainty for chemical testing laboratories

- Method validation
- Understanding ISO/IEC 17025 – requirements for analytical laboratories

- Laboratory management – role of the Quality Manager and technical management
- Laboratory internal audit

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Our training courses

At LGC, we pride ourselves in providing our customers with high quality products and services. We are committed to offering first-rate training courses for analytical scientists. With over 20 years' experience in delivering training programmes worldwide, our team of professionals will help ensure you meet current quality standards by providing:

- A programme of scheduled courses written and delivered by expert analytical scientists ensuring up-to-date information on current accreditation and regulatory issues
- Best practice training for all laboratory personnel, whether working at the bench or in management
- Courses relevant to the laboratory environment with focus on application rather than theory
- Comprehensive course packs; a vital reference source
- Opportunities to practise newly acquired knowledge through laptop-based workshop sessions using Excel
- 'Off-the-shelf' and tailored training solutions, delivered at LGC headquarters or your own location.

Our scheduled courses are detailed in this brochure and provide training in key areas of analytical quality assurance, including **statistics**, **method validation** and estimation of **measurement uncertainty**.

“Over 95% of respondents feel that our training courses meet their expectations”

A wealth of experience in providing analytical quality training

During the last 20 years we have been working to deliver over **300 analytical quality training courses** to more than **600 organisations from 40 countries**. Over **3700 delegates** have attended our courses at our headquarters in the UK and locations all over the world.

Our promise on quality

We monitor feedback from delegates to identify new course topics, improve our training material and to reflect changes to analytical quality requirements.



Why attend one of our courses?

To meet accreditation and regulatory requirements

The need to meet increasingly stringent regulatory and quality requirements has resulted in greater emphasis on **method validation, evaluating measurement uncertainty** and establishing the **traceability of results**. This is reflected in international accreditation standards such as ISO/IEC 17025 and ISO 15189, used as a basis for establishing the competence of testing and calibration laboratories by national accreditation bodies. Our courses will help you meet these requirements.

To develop the skills of your team members

Companies which invest responsibly in the development of the skills of their staff maximise their business opportunities. Those individuals with enhanced skills are better placed to take advantage of workplace opportunities, helping to build a rewarding career and contribute to their futures.

To have confidence in reported results

Analytical quality is of paramount importance in chemical and bioanalytical measurements in order to make sound decisions based upon results. Our courses will provide an increased understanding of the use of statistical tools for data analysis to give you and your customers confidence in the quality of the data you produce.

To access up-to-date course material delivered by experts

Our team of trainers has extensive experience of analytical quality assurance, with expertise in method validation, measurement uncertainty, traceability, reference materials and proficiency testing.

All our courses consist of presentations and workshop sessions to stimulate group discussion and to give the opportunity to practise newly acquired knowledge. Where relevant, delegates will use laptops running Excel to facilitate data analysis. To ensure maximum benefit, delegates work in small groups with one or more tutors present during the workshops.

Because our courses provide good value all round

LGC's trainers have access to a wide network of experts within and outside the organisation. As well as getting an opportunity to work through practical sessions to aid understanding of the principles covered, delegates also have the chance to ask questions and explore technical issues with the trainers and other delegates.

We offer discounts for group bookings (see page 9). We also provide training at customer sites which is a cost effective solution if you have a number of staff who require training.

In the UK, LGC has agreed a reciprocal programme of training with UKAS (United Kingdom Accreditation Service) to extend both organisations' range of training courses. As part of this agreement, the UKAS courses listed in this brochure can be booked through LGC.

www.lgcgroup.com/training

Customised training and consultancy services

We know that the needs of each individual company may differ so a customised solution is often required. Whether you are looking to develop measurement capability in a new laboratory, or you are an established laboratory seeking to maintain or extend your current accreditation, our customised and on-site training and consultancy services may be the most cost effective and practical answer.

We can come to you

We can deliver any of the LGC courses listed in this brochure at your own location. Additionally, we can also work with you to create a customised training and consultancy programme to fulfil your development objectives. As well as the listed courses we can also provide training on topics such as:

- Traceability: establishing the traceability of measurement results is an accreditation requirement that can be achieved through the use of appropriate standards. However, this can be at times a complex and challenging issue. We can provide training and guidance to help you meet current requirements.
- Technical training: our long history and our role as the UK's National Measurement Laboratory and Designated Institute for chemical and bio-measurement means that we have a wide range of expertise in analytical techniques such as:
 - Chromatography
 - Mass spectrometry and hyphenated techniques (e.g.LC-MS, GC-MS, ICP-MS)
 - PCR, quantitative PCR (qPCR) and digital PCR (dPCR)

Our expertise in these techniques is underpinned by our knowledge of standards, regulations and our awareness of global measurement challenges.

We can help with putting theory into practice

There are times when putting knowledge into practice is challenging or even confusing. Analytical quality topics are usually presented in a generic manner, so they can be applied to different scenarios in the laboratory. However, depending on the complexity of the analytical method, the availability or lack of reference materials, time constraints and available expertise, applying theory to practical situations can be daunting.

We offer tailored consultancy services to help you in these cases. We can work with you to understand your requirements and provide practical help and guidance to:

- Design validation studies and experiments
- Write and review validation protocols
- Review analytical data to establish fitness for purpose
- Estimate the uncertainty of measurement.

These are some examples of the services we have offered customers, but we are not limited to these. If you have any queries or issues related to method validation, measurement uncertainty and implementing quality management systems get in touch with us to see how we can help.

Give us a call on +44 (0)20 8943 7631 or email us at training@lgcgroup.com to discuss your training or consultancy needs.

Our customers

LGC has worked with a wide range of organisations in different sectors including chemical manufacturing, pharmaceuticals, environmental and food analysis, utility services and academia. A significant number of our customers return to us for further courses.

Some of the customers we have provided training and consultancy services to:



Alfred H Knight International Ltd • Augean PLC • AWE • Barts Health NHS Trust • BM Polyco • Dairy Crest • Dounreay Site Restoration Limited • EuroCaps • EXPRO • GA Pet Food Partners • Home Office Science – Centre for Applied Science and Technology • Huntsman • Johnson Matthey (Emission Control Technologies) • New Victoria Hospital • Saudi Food and Drug Authority • Scotland's Rural College • South West Water

Our trainers

LGC trainers bring to our courses a wealth of knowledge and experience gained from their different technical backgrounds. Below are details of our core team of trainers.



Vicki Barwick has over 20 years' experience in the area of analytical quality and has considerable knowledge of method validation and the application of measurement uncertainty principles to analytical chemistry. Vicki has produced many training resources on analytical quality assurance and was a co-author of 'Quality Assurance in Analytical Chemistry', published by Wiley.



Malcolm Burns is LGC's Principal Scientist for food authenticity testing and the manager for the UK National Reference Laboratory for GMOs. He has over 15 years' experience delivering projects aimed at addressing the measurement issues associated with food authenticity and fraud, specialising in method validation, measurement uncertainty and standardisation of data analysis and interpretation.



Simon Cowen leads the statistics team at LGC and has over 10 years' experience of providing statistical analysis and consultancy services to researchers and analysts, both within LGC and to external clients. His specialist areas include molecular biology and forensic DNA research, and the interpretation of forensic evidence. He has created and delivered several internal training courses for forensic scientists.



Steve Ellison is an international expert in measurement uncertainty. He is a co-author of the Eurachem/CITAC Guide 'Quantifying Uncertainty in Analytical Measurement'. Steve lectures throughout the world on measurement uncertainty, and is a member of a number of national and international networks and technical committees working on quality assurance and statistics for analytical chemistry.



Wayne Gaunt is a Technical Manager for the chemistry department in the Proficiency Testing group at LGC, where he is directly responsible for the production, development and technical operations of a variety of proficiency testing schemes ranging from food chemistry and brewed and distilled alcoholic beverages, to safety of toys and jewellery. He is a chartered analytical chemist with a degree in pure and applied chemistry.



Alan Handley has over 40 years' experience in leading analytical operations in chemical laboratories. Alan is a former President of the Royal Society of Chemistry's (RSC) Analytical Division and current Vice President and former President of The Chromatographic Society. He has been awarded the RSC Distinguished Service Award for contributions to Analytical Chemistry by a non-academic.



Daniel Hopkins is a Project Manager responsible for leading the continuous improvement programme for LGC's Health Science and Innovation Division. He has a background in molecular biology with over 10 years' experience in managing process improvement projects across a range of disciplines, with expertise in Lean methodologies including process mapping and process modelling.



Jim Huggett is LGC's Principal Scientist for Nucleic Acid Research. Jim has over 15 years' experience in the genetics research area with a focus on the development of metrologically sound microbial analysis approaches to support diagnostics. Jim has an extensive publication record, is the managing editor of the Elsevier journal 'Biomolecular Detection and Quantification' and has co-edited the book 'Molecular Diagnostics: Current Research and Applications'.



Thierry Le Goff has over 15 years' experience in calibration and testing services, having managed LGC's calibration services in accordance with ISO/IEC 17025 Calibration Status and the production and certification of reference materials in accordance with ISO Guide 34. He is a consultant in ISO/IEC 17025 and ISO Guide 34 and a technical assessor for the French Accreditation Service (COFRAC).



Tracey Noblett has over 30 years' experience in microbiology, working in various fields including clinical, water and food testing. The past 20 years have been spent in the field of proficiency testing, and have included developing new schemes, provision of technical support, ensuring quality and gaining accreditation to ISO/IEC 17043. Tracey is a member of the Eurachem Proficiency Testing Working Group.



Ulf Örnemark is an independent consultant in analytical quality. He has a broad background in quality assurance including proficiency testing, uncertainty evaluation and quality management systems. Ulf is an authorised trainer of the EU Joint Research Centre's TrainMiC programme and also advisor to the Swedish accreditation body (SWEDAC).



Elena Sanchez has a background in laboratory quality assurance and implementation of the ISO/IEC 17025 quality standard in molecular biology laboratories. She has extensive experience in DNA analytical techniques for commercial applications and in the implementation and validation of automated systems. Elena also has over 10 years' experience in training and workshop facilitation.



Matthew Whetton has over 15 years' experience working in the field of analytical chemistry using state of the art techniques for the analysis of phytochemicals and pesticides in food and environmental matrices. Matthew is the Head of Chemistry for the Proficiency Testing group at LGC, where he is responsible for the production, development and technical operation of eighteen proficiency testing schemes in a diverse range of analytical fields.



Bernadette Francis is an experienced PA and has been providing administrative support to the training team for seven years. Bernadette deals with all aspects of course administration including responding to enquiries, handling course bookings and facilitating the delivery of courses, both at LGC and other locations.

About LGC

LGC is an international science-based company operating across a wide range of markets which underpin the safety and health of the public. We work with our customers in healthcare, agri-food and the environment as well as with the UK government to achieve excellence in investigative, diagnostic and measurement science. **Science for a safer world** is at the heart of all we do.

LGC's origins can be traced back to 1842, as the Laboratory of the Board of Excise, founded to regulate the adulteration of tobacco. LGC was privatised in 1996 and still retains the unique function of the 'Government Chemist' which provides expert opinion, based on independent chemical and bioanalytical measurement, to help avoid or resolve disputes pertaining to food and agriculture.

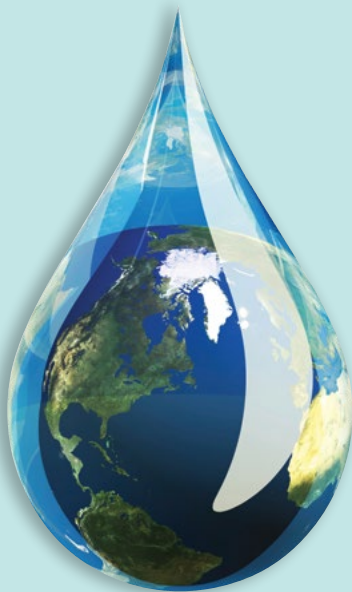
As well as fulfilling key regulatory and advisory roles, we offer high quality laboratory services, products and consultancy solutions built upon the scientific and technical expertise of our staff:

- We are the UK's National Measurement Laboratory and Designated Institute for chemical and bio-measurement, offering unparalleled expertise on matters related to standards, regulation and global measurement challenges to underpin growth in trade and support innovation.
- We host the MHRA (Medicines and Healthcare products Regulatory Agency) laboratory, responsible for ensuring the quality and safety of medicines in the UK.
- We test over 6,000 products and supplements each year, giving athletes the confidence that products are free from banned substances.

- We have played a key part in the BSE eradication programme, having tested over 3.6 million cattle in the UK since 2001.
- We offer reference materials and proficiency testing schemes worldwide to support laboratories in ensuring the quality of their measurements.

LGC has a proven track record in developing training resources, and delivering training courses and consultancy services on quality assurance for our customers worldwide.

These are just a few examples of the work we do. For more information on the services and products we can offer visit: www.lgcgroup.com



Course venues and group discounts

LGC's courses are held at our headquarters in Teddington, south west London, which are situated close to Hampton Court Palace and Bushy Park.

LGC

Queens Road
Teddington
Middlesex
TW11 0LY
UK

LGC's training venue is conveniently located for travel by either car (easily accessible from the M3, M4 & M25), rail (30 minutes direct from London, Waterloo) or air (30 minutes by taxi from Heathrow airport).

Detailed directions and a map will be sent to delegates prior to the course. Information on local accommodation will also be provided.

The courses listed in this programme that are provided by UKAS are all held at Denham Grove, Buckinghamshire.

UKAS

Denham Grove
Tilehouse Lane
Denham
Buckinghamshire
UB9 5DG
UK

Group-booking discounts

If you have a number of staff who wish to attend a particular scheduled course we are pleased to offer the following group-booking discounts:

- Second delegate: **5% discount**
- Third delegate: **8% discount**
- Fourth and subsequent delegates: **10% discount**

Discounts can only be applied to bookings made for the same course date.





Get in touch

To book a place on one of our courses, for further information or to be added to our mailing list:

- Call Bernadette Francis: +44 (0)20 8943 7631
- Email: training@lgcgroup.com
- Book online at: www.lgcgroup.com/training
- Visit our 'Training Resource Centre' for free samples of our training material at www.lgcgroup.com/training
- Follow us on twitter: [@LGCgroup](https://twitter.com/LGCgroup)

Our terms and conditions

The course fee includes a delegate pack, lunch and refreshments. A list of local accommodation will be supplied.

Payment and discounts

- All fees must be paid in advance of the course
- VAT is payable on all training course fees
- Payments can be made by cheque, credit card and BACS
- To be invoiced for the course fees, please supply a purchase order number with your booking
- Provisional bookings can only be held for ten working days
- There are discounts available for group bookings (see page 9).

Cancellations and substitutions

- A full refund will be provided for cancellations received more than 30 working days before the commencement of the training course
- A refund of 50% will be provided for cancellations received between 15 and 30 working days before the commencement of the training course
- No refunds will be given for cancellations received fewer than 15 working days before the commencement of the training course
- Substitutions will be accepted at any time at no additional charge.

Transfers

Registered delegates who wish to transfer to a different date for the same course (subject to availability) can do so for the following charges:

- No charge for transfer notification received more than 30 working days before the commencement of the training course
- A charge of £50 + VAT for transfer notification received between 15 and 30 working days before the commencement of the training course
- A charge of £100 + VAT for transfer notification received fewer than 15 working days before the commencement of the training course.

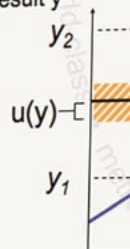
LGC reserves the right to cancel or amend its training courses. Registered delegates will be informed and, where applicable, their training course fee refunded.

LGC scheduled courses

LGC offers a programme of scheduled courses which provide training in key areas of analytical quality assurance.

$$u(y) = \frac{(x_2 - x_1)}{(x_2 - x_1)} \times u(x)$$

Measurement
result y



Statistics for analytical scientists

Find out how to get the most from your data by applying key statistical techniques

Ensuring the quality of analytical data is a vital aspect of the work of an analytical scientist. The effective planning of experiments and evaluation of data requires an understanding of statistics. Knowledge of statistics is also needed to carry out method validation and evaluate measurement uncertainty. This course is aimed at analysts and covers the statistics most commonly applied to analytical data. It will allow analysts to answer questions such as, 'Which is the best way to summarise my data?', 'Is there a real difference between the results produced by different test methods?', 'How should I evaluate the results obtained from an instrument calibration experiment?' The course includes laptop-based workshops using Excel.

Who should attend?

The course is aimed at analysts who need to evaluate data or carry out tasks such as method validation and uncertainty estimation.

The course focuses on the practical application of statistical techniques and is suitable for those with limited or no prior experience of statistics.

What are the benefits?

This course will help you:

- Understand some of the most important statistical concepts used by analytical scientists
- Calculate the most commonly used statistical parameters
- Carry out significance tests to identify differences between sets of data
- Use linear regression in calibration
- Use Excel functions for the analysis of data.

Contents

The course will cover:

- Introduction to statistics
- Significance testing: t- and F-tests
- Analysis of variance (ANOVA)
- Linear regression
- Control charts.

Our customers say

"This is a very good training course. Brilliant lecturer, very coherent, knew what she was talking about. I learnt more about statistics today than I ever had"

"Excellent training course and extremely valuable"

Course details

Dates	Code	Price
21 February 2018	TRSTAT44	£500 + VAT
19 September 2018	TRSTAT45	£500 + VAT

Further statistical tools for analytical scientists

Further your knowledge of the application of statistics to analytical science

Modern analytical instruments are capable of producing a large amount of data. To interpret this data effectively requires the application of statistics. This course builds on the topics covered in the 'Statistics for analytical scientists' course and includes some more advanced statistical tools. It will allow analysts to address issues such as identifying outliers in a data set, handling non-normal distributions of data and carrying out weighted and non-linear regression. The course includes laptop-based workshops using Excel.

Who should attend?

This course is aimed at analytical scientists who have to plan experimental studies and/or make decisions based on sets of data. It is suitable for those who have a basic knowledge of statistics.

What are the benefits?

This course will help you:

- Deal with normal and non-normal distributions
- Identify cases of normally distributed data with outliers
- Calculate statistical parameters in the presence of probable outliers
- Identify where two-way ANOVA is appropriate
- Use some of the more advanced regression tools
- Use Excel functions for the analysis of data.

Contents

The course will cover:

- Handling of non-normal data
- Dealing with outliers
- Robust statistics
- Fitting non-linear functions
- Weighted regression
- Two-way ANOVA with and without replication.

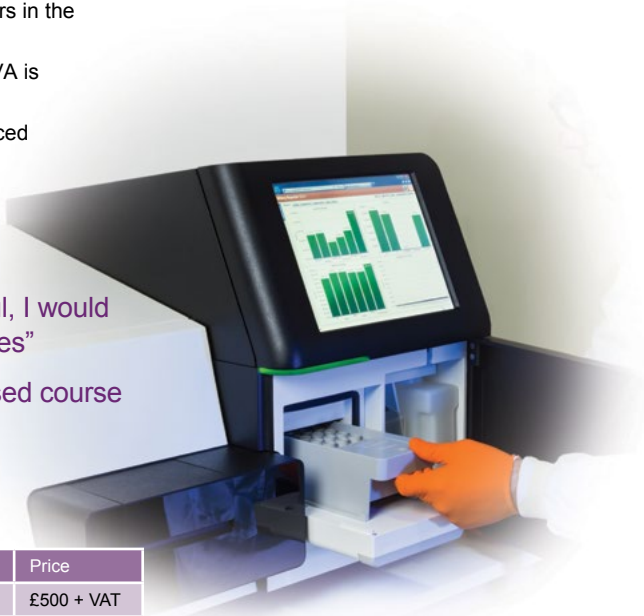
Our customers say

"This course is very useful, I would recommend it to colleagues"

"A useful and well organised course with excellent resources"

Course details

Dates	Code	Price
9 May 2018	TRFST29	£500 + VAT
29 November 2018	TRFST30	£500 + VAT



Designing effective experiments – principles of experimental design

Learn how to plan, execute and analyse efficient experiments

Modern analytical methods and production processes used in research and manufacturing are complex, with many different factors affecting the outcome. In order to be competitive, companies need to minimise resources expended on development and maximise process performance. Design of Experiments (DoE) enables these complex situations to be understood, reducing the cost of gaining an in-depth knowledge of the process which can be translated into competitive advantage. It is also a tool required by most of the regulatory agencies worldwide (including, for example, the US Food and Drug Administration). DoE provides a well-structured method for determining the relationships between factors affecting the process under study.

Who should attend?

The course is aimed at analytical scientists and laboratory managers who need to plan experimental studies for analytical method development, or for product or process improvement, and who wish to develop an understanding of the main types of experiment used in industrial experimental design. The course is suitable for those who have a basic knowledge of statistics, including a basic understanding of significance testing, linear regression and analysis of variance.

What are the benefits?

This course will help you:

- Develop a systematic approach to experiments for scientific research, method development and product improvement
- Recognise and understand the advantages of the main types of experimental design
- Choose the most efficient experiment for each problem
- Understand how to interpret the results
- Apply the principles of experimental design during laptop-based workshops.

Contents

The course will cover:

- Doing the right experiment – setting objectives
- Simple experiments for single effects
- Estimating sample size for simple designs
- Strategies for reducing nuisance effects – randomisation, paired experiments and blocked designs
- Studying multiple effects – factorial designs
- Efficient screening experiments using fractional factorial designs
- Designs for optimisation – basic response surface models
- Analysing and interpreting designed experiments.

Our customers say

“This course is very good and I hope to use these techniques for experimental work as soon as I return to the lab”

Course details

Dates	Code	Price
23 – 24 May 2018	TRDOE10	£890 + VAT
26 – 27 September 2018	TRDOE11	£890 + VAT

Using Excel spreadsheets for data analysis in testing laboratories

Make the most of your Excel package in the laboratory

Data analysis is a vital aspect of the work of an analytical scientist, and it is often facilitated by using Excel spreadsheets. Excel may be used to carry out the statistical analysis of data, automate the production of results and aid data trackability. The effective use of Excel for the evaluation of data requires an understanding of its functions and the correct use of statistics. This course is aimed at analysts and covers the main Excel functions commonly applied to data analysis. The course will include hands-on workshops using laptops to facilitate the application of theory.

Who should attend?

The course is aimed at analysts who are beginning to use Excel for tasks such as summarising data (using basic functions and formulas), producing calibration curves, or statistical analysis. The course will also be useful for anyone who is self-taught and looking to fill any gaps in their knowledge.

The course focuses on the practical application of Excel and is suitable for those with limited or no prior experience of using Excel.

What are the benefits?

This course will help you:

- Understand the main Excel functions used to evaluate analytical data
- Calculate the most commonly used statistical parameters
- Produce calibration plots
- Use linear and polynomial regression in calibration
- Maintain integrity of analytical data.

Our customers say

“Excellent course. Great base for me to study further”

Course details

Dates	Code	Price
12 September 2018	TREXC05	£320 + VAT

Contents

The course will cover:

- Designing clear data tables
- Using basic calculation functions
- Using functions and formulas to produce reliable results
- Using pivot tables
- Best practice in protecting and linking cells and spreadsheets
- Plotting charts, linear regression, polynomial regression
- Using the data analysis add-in to carry out statistical analysis of data.



Evaluating measurement uncertainty for chemical testing laboratories

Learn the principles and practice of estimating measurement uncertainty

Whenever a measurement is made there will always be some uncertainty about the result due to unavoidable errors in the measurement process. Knowledge of this uncertainty allows a judgement to be made as to whether the data are likely to be 'fit for purpose'. For example, when determining whether a limit has been exceeded, a meaningful interpretation of the results can only be achieved if the uncertainty is known. The evaluation of the uncertainty associated with measurement results is a requirement for testing laboratories accredited to ISO/IEC 17025. This course provides a practical approach to evaluating uncertainty in testing laboratories which is in line with the ISO principles for uncertainty estimation and current accreditation requirements. The course assumes no prior knowledge of uncertainty evaluation and includes laptop-based workshops using Excel.

Who should attend?

The course is aimed at analysts who have limited knowledge of measurement uncertainty but need to be able to evaluate the uncertainty associated with their results.

What are the benefits?

This course will help you:

- Understand how uncertainty can be evaluated for chemical test results
- Use method validation and quality control data in uncertainty estimates
- Give your customers confidence in your results
- Determine the fitness for purpose of your results
- Demonstrate compliance with regulatory limits and contract specifications
- Make valid comparisons between results obtained at different times and places
- Meet ISO/IEC 17025 accreditation requirements
- Apply statistical principles through laptop-based workshops.

Contents

The course will cover:

Day 1 – The principles

- Introduction to the concept of measurement uncertainty
- Statistics for measurement uncertainty estimation
- Basic principles of evaluating uncertainty: converting and combining uncertainties
- Cause and effect analysis
- Quantifying uncertainty components
- Approaches to uncertainty estimation.

Day 2 – The practice

- Evaluation of an uncertainty budget using spreadsheets
- Using data from validation studies
- Dealing with data from recovery estimations
- Using precision data from validation studies
- Handling uncertainty for large concentration ranges
- Using and conveying uncertainty estimates.

Our customers say

"It is a very good course and covers a vast amount of information; the course pack will prove very valuable as a reference point"

Course details

Dates	Code	Price
6 – 7 March 2018	TRMU75	£890 + VAT
6 – 7 June 2018	TRMU76	£890 + VAT
17 – 18 October 2018	TRMU77	£890 + VAT

Method validation

Learn how to demonstrate that your test methods are fit for purpose

Method validation is the process that provides evidence that a test method is capable of producing results that are suitable for a particular application. It is a requirement of the ISO/IEC 17025 and ISO 15189 laboratory accreditation standards and many other sectoral regulations and directives. Method validation should always be a planned activity. This course introduces the statistics required for interpreting validation data and provides the tools to plan and carry out effective validation studies. There is ample opportunity to practice the principles learned through laptop-based workshops using Excel.

Who should attend?

This course is primarily designed for analysts and laboratory managers in the analytical chemistry and related sectors.

What are the benefits?

This course will help you:

- Understand method validation and its requirements
- Select and apply the statistics required during method validation
- Select and use the appropriate types of method validation studies
- Appreciate and understand the link between method validation and measurement uncertainty
- Apply statistical principles through laptop-based workshops.

Our customers say

“Excellent, excellent course. Very valuable and relevant to biomedical and clinical scientists working in hospitals seeking ISO 15189 accreditation.”

“Great course, necessary for people needing accurate information on what is required for validation, especially for UKAS accredited testing”

Contents

The course will cover:

Day 1: Essential statistics

- Introduction to statistics for method validation
- Significance testing – t-tests and the F-test
- Analysis of variance (ANOVA)
- Linear regression.

Day 2: Providing the tools

- Introduction to the concepts of method validation
- Performance parameters: precision, bias and ruggedness.

Day 3: Further tools

- Performance parameters: selectivity, capability of detection, linearity and working range
- Using validation data to estimate measurement uncertainty.

Course details

Dates	Code	Price
20 – 22 March 2018	TRMV65	£1350 + VAT
17 – 19 July 2018	TRMV66	£1350 + VAT
4 – 6 December 2018	TRMV67	£1350 + VAT

Understanding ISO/IEC 17025 – requirements for analytical laboratories

Improve your awareness and understanding of ISO/IEC 17025 and its requirements

ISO/IEC 17025, 'General requirements for the competence of testing and calibration laboratories' is the current international standard for the accreditation of testing and calibration laboratories. The standard provides an internationally recognised basis for laboratories to ensure and demonstrate the quality of their results. It is essentially a list of competence criteria which the laboratory needs to meet by implementing an effective quality system. For laboratories to implement the standard effectively, staff should have an understanding of the need for accreditation and of the main requirements of the standard. This course covers the standard and its application in detail and includes the changes introduced in the recently published 3rd edition. The course will clarify concepts and terminology and demonstrate their application through practical workshops.

Who should attend?

The course is aimed at laboratory managers, quality managers and analysts in both accredited analytical laboratories and laboratories seeking accreditation.

What are the benefits?

This course will help you:

- Understand the benefits of a formal quality management system
- Gain a better understanding of the management requirements of the standard
- Interpret and meet the technical requirements of the standard
- Create and maintain effective quality management systems.

Contents

The course will cover:

- The ISO/IEC 17025 standard: clauses and guidance notes
- Structure of quality management systems
- Key components of the standard:
 - Management requirements
 - Technical requirements: method validation and uncertainty
- Changes in the 3rd edition of the standard
- The role of UKAS.

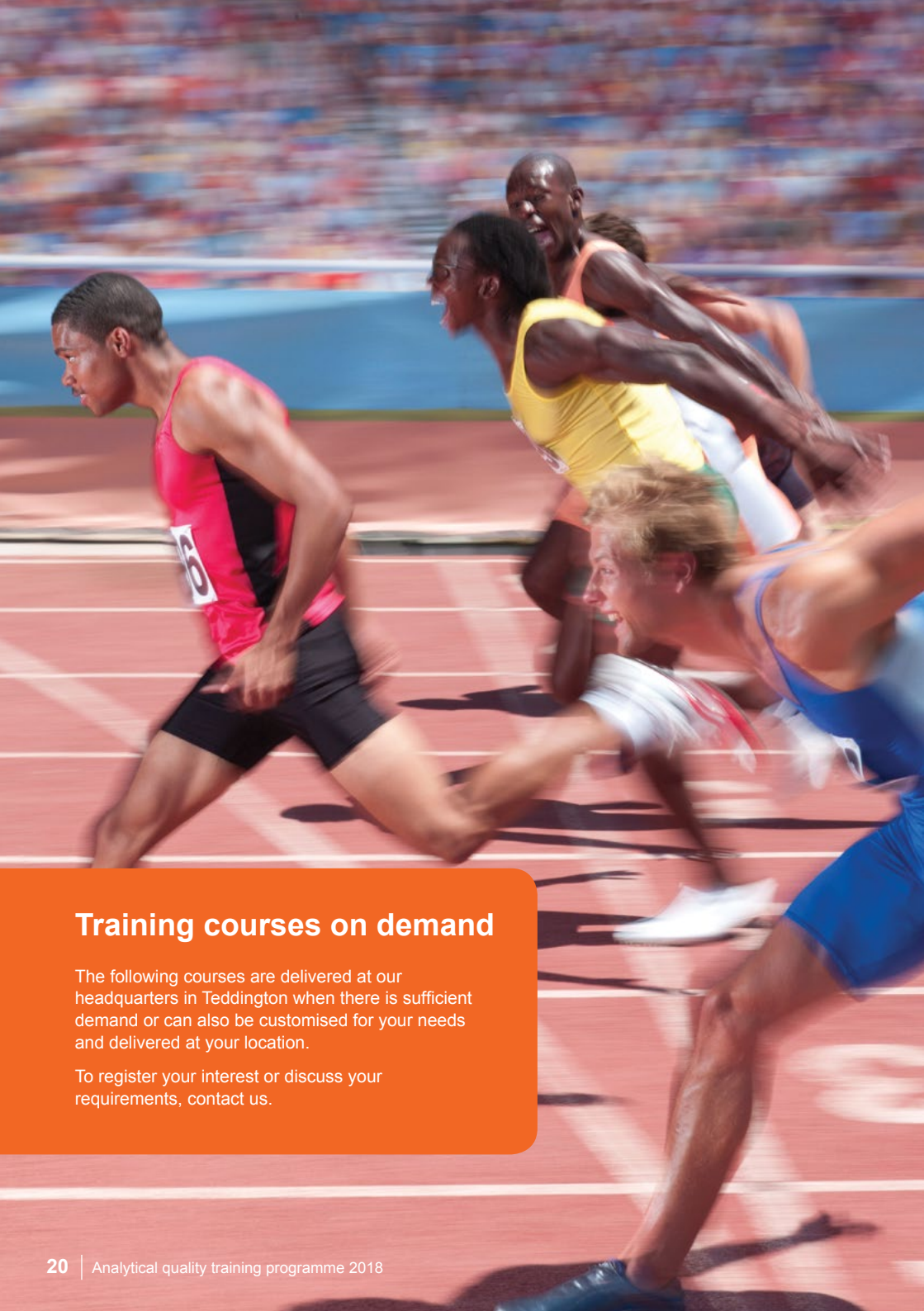
Our customers say

"This course has been a very valuable insight into ISO 17025 and has helped to steer us all in the same/correct direction"

Course details

Dates	Code	Price
1 March 2018	TRISO19	£500 + VAT
1 November 2018	TRISO20	£500 + VAT





Training courses on demand

The following courses are delivered at our headquarters in Teddington when there is sufficient demand or can also be customised for your needs and delivered at your location.

To register your interest or discuss your requirements, contact us.

Continuous improvement for efficient laboratories

Discover the Lean approach to building efficient and competitive laboratory operations

For laboratory operations to remain agile and competitive in the market place it is essential to improve services whilst reducing cost. Increasing turnover whilst keeping costs down, reducing waste and repeat work, and freeing up resources to increase capacity are common challenges for laboratory managers. Additionally, laboratories accredited to ISO/IEC 17025 are required to demonstrate continuous improvement in how they operate.

The Lean approach to process improvement was developed in the manufacturing industry but it is just as applicable to laboratories wishing to improve quality and performance. Adopting this approach has been shown to help businesses:

- Streamline processes and eliminate waste
- Reduce delivery times
- Improve productivity
- Increase customer satisfaction.

This course introduces the fundamental principles behind Lean practice and the systematic approach to continuous improvement. Participants will learn how to use valuable tools such as CANDO, KANBAN, process mapping, cause and effect diagrams, Pareto diagrams, and performance measurement tools.

What are the benefits?

This course will help you:

- Gain an understanding of the systematic Lean approach to continuous improvement
- Develop practical skills that will enable you to develop a Lean culture within your team
- Understand how and when to use key process improvement tools
- Produce simple, effective plans for successful improvement projects.

Contents

The course will provide:

- An introduction to Lean theory
- Practical coaching in the use of Lean tools and methods
- A systematic approach to managing continuous improvement
- Real examples where process improvements have helped laboratories.

Who should attend?

The course provides greatest benefit when groups of individuals from a company attend the course together, with a view to using the skills gained to initiate team-based improvement programmes.

The training is aimed at anyone expected to develop and promote a culture of continuous improvement in their workplace, including individuals who manage day to day delivery, team leaders and project managers.

Course details

This course will be delivered as an on-site course. Please contact us to discuss your requirements for training on continuous improvement.

Consultancy

As well as providing training in the principles, we offer consultancy services to help identify, implement and measure continuous improvement activities. Our team of experienced practitioners will assess your requirements and provide a programme of work to help you achieve your improvement objectives. Contact us to discuss your requirements.

Using proficiency testing in the analytical laboratory

Participation in a proficiency testing (PT) scheme gives laboratories an independent and objective measure of the quality of their output and is therefore a highly effective diagnostic tool for a laboratory's quality system. There is more to be gained from PT results than a simple assessment of 'satisfactory' or 'unsatisfactory' performance. This course focuses on the interpretation of PT performance scores and the types of investigations and corrective actions that may be required in the event of an unsatisfactory score. The course also covers the statistics commonly used in PT schemes which will aid with the interpretation of PT data.

This course is designed for laboratory staff (chemists and microbiologists) who participate in PT schemes and/or are responsible for the interpretation of PT results. The course is also suitable for laboratory customers and auditors who use PT scheme performance as a tool for monitoring a laboratory's quality.

What are the benefits?

This course will help you:

- Understand how PT works and the different types of schemes that are available
- Interpret and use effectively the results and evaluation from PT schemes
- Understand the statistical approaches used in proficiency testing.

Contents

The course will cover:

- An introduction to PT, how it works and its objectives
- Statistics used in PT schemes
- Interpretation of PT scheme data
- Feedback on laboratory performance and corrective actions.

The cost of attending this course is

£500 + VAT



Introduction to method validation for biologists

Method validation studies are essential for establishing the quality of measurement data. Validation is the formal process that provides objective evidence that methods of analysis are fit for purpose, and its importance is reflected by its inclusion in laboratory accreditation standards and other sectoral regulations and directives. This course offers an introduction to the key principles of validation for biological analysis and provides guidance on planning effective validation studies.

The course is aimed at biological scientists and laboratory managers who are involved with the assessment and development of quantitative methods employing molecular biology techniques. It is suitable for those with limited or no previous experience of statistics.

What are the benefits?

This course will help you:

- Understand the general principles and importance of method validation
- Identify the relevant parameters for evaluating method performance
- Plan suitable validation studies
- Understand how to evaluate data from validation studies effectively.

Contents

The course will cover:

- Introduction to method validation
- Selecting and evaluating the appropriate method performance parameters
- Defining the validation criteria for different parameters
- A validation case study.

The cost of attending this course is
£500 + VAT

Laboratory management – role of the quality manager and technical management

UKAS provides this course

All laboratories need to have sound business processes to enable them to deliver technically sound calibrations and tests to their clients. When a laboratory is seeking to have its competence recognised through accreditation by UKAS, these processes must also enable the laboratory to meet the requirements of ISO/IEC 17025.

Who should attend?

This course is aimed at personnel from accredited or applicant laboratories who have responsibility for the technical or quality management of the tests or calibrations performed.

What are the benefits?

This course will help you:

- Understand how the business processes of your laboratory can be combined effectively with the requirements of ISO/IEC 17025
- Understand the roles of quality manager and technical management.

Contents

The course will cover:

Day 1

- Laboratory structure and roles of QM and TM
- Organisation charts
- Quality management system
- Job descriptions
- Laboratory facilities, services and supplies
- Equipment and reference materials
- Purchasing equipment and calibration programme.

Day 2

- Personnel training and records
- Requests, tenders, contracts and subcontracting
- Documentation and document control process
- Test and calibration methods
- Method validation
- Customer samples and items.

Day 3

- Calibration and test performance
- Work sheets
- Management controls (QC and internal audit)
- Audit schedule planning
- Non-conforming work
- Records (including opinions and interpretations).

Course details

* Includes course materials, lunch and refreshments. Accommodation is not included.

Dates	Code	Price*
9 – 11 January 2018	TRLM46	£1270 + VAT
24 – 26 April 2018	TRLM47	£1300 + VAT
3 – 5 July 2018	TRLM48	£1300 + VAT
16 – 18 October 2018	TRLM49	£1300 + VAT



Laboratory internal audit

UKAS provides this course

All laboratories need to carry out an internal audit of their business processes and performance of tests and calibrations to ensure delivery of a competent service to their clients. An accredited laboratory needs to check not only that laboratory personnel at all levels are implementing the prescribed processes but also that its systems and practices are compatible with the requirements of ISO/IEC 17025.

Who should attend?

The course is suitable for anyone involved with or interested in the use of internal audits, new quality managers and new laboratory staff.

What are the benefits?

This course will help you:

- Understand the internal audit process and its value
- Gain confidence in performing internal audits.

Contents

The course will cover:

Day 1

- Internal laboratory audits
- Content of an audit programme
- Audit records and checklists
- Witnessing activities
- Corrective and preventive actions
- Developing corrective and preventive action forms
- Human aspects of auditing.

Day 2

- Reporting findings to auditees
- Preparing an audit report for management
- Reporting on corrective and preventive actions
- Management review.

Course details

* Includes course materials, lunch and refreshments.
Accommodation is not included.

Dates	Code	Price*
12 – 13 June 2018	TRLIA54	£1000 + VAT
9 – 10 October 2018	TRLIA55	£1000 + VAT





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