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OUR TRAINING COURSES

We have been providing first-rate training courses for analytical scientists worldwide for over 20 years. Our team of trainers will help ensure you meet current quality standards by providing:

- Courses written and delivered by expert analytical scientists with up-to-date information on current accreditation and regulatory issues
- Training on quality assurance best practice for all laboratory personnel, whether working at the bench or in management
- A focus on application rather than theory
- Comprehensive course packs
- Opportunities to practise 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.

WHAT OUR CUSTOMERS SAY

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

Method Validation

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

Measurement Uncertainty

“The course was excellent, very well structured with useful workshops.”

Statistics for Analytical Scientists

“It was a fantastic course, very well done and well structured. Every aspect we covered was explained well, at the right pace.”

On-site Method Validation course

“It was great to have this course in-house. It’s hands-on and relevant to what I do day-to-day in the analytical lab.”

On-site Statistics for Analytical Scientists course
WHY ATTEND ONE OF OUR COURSES?

TO MEET ACCREDITATION AND REGULATORY REQUIREMENTS

International accreditation standards such as ISO/IEC 17025 and ISO 15189 include requirements relating to method validation, measurement uncertainty and establishing the traceability of results.

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.

TO HAVE CONFIDENCE IN REPORTED RESULTS

Our courses will help you use statistical tools for data analysis to give you and your customers confidence in the quality of the results you produce.

BECAUSE OUR COURSES PROVIDE GOOD VALUE ALL ROUND

We offer discounts for group bookings (see page 7). 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). As part of this agreement, the UKAS courses listed in this brochure can be booked through LGC.

GET IN TOUCH

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

Book online:
www.lgcgroup.com/training

Email: training@lgcgroup.com

Call us: +44 (0)20 8943 7631

Visit our Training Resource Centre for free samples of our training material at www.lgcgroup.com/training

Follow us on Twitter: @NML_ChemBioGC
OUR TRAINING OPTIONS

We provide a flexible approach to training delivery. You can come to us, or we can come to you. **Talk to us to find out more.**

**OFF-SITE TRAINING COURSE PROGRAMME**

Our scheduled courses are ideal for individual participants. They are described in this brochure and on our website, www.lgcgroup.com/training.

**ON-SITE TRAINING OPTIONS**

**Off-the-shelf courses:** we can deliver any of our scheduled courses at your site. This is usually the most cost effective option when five or more delegates from the same organisation need to attend the same course.

**Customised courses:** we can work with you to create a customised training and consultancy programme to fulfil your development objectives. As well as customising the courses listed in this brochure, we can 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 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), and PCR (qPCR and dPCR).

**Consultancy:** we can help with putting theory into practice. There are times when putting knowledge into practice is challenging or even confusing. 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 or implementing quality management systems, get in touch with us to see how we can help.

**CONTACT US**

+44 (0)20 8943 7631
training@lgcgroup.com
www.lgcgroup.com/training
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.

OVER 95% OF RESPONDENTS FEEL THAT OUR TRAINING COURSES MEET THEIR EXPECTATIONS

WE HAVE TRAINED
OVER 4500 DELEGATES FROM MORE THAN 700 ORGANISATIONS

WE HAVE DELIVERED
OVER 380 ANALYTICAL QUALITY TRAINING COURSES

WE HAVE TRAINED DELEGATES FROM OVER 45 COUNTRIES

WE HAVE A WEALTH OF EXPERIENCE IN PROVIDING ANALYTICAL QUALITY TRAINING
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 training team members; you can find details of all our trainers on our website: www.lgcgroup.com/training

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.

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.

Ulf Örnemark is an independent consultant in analytical quality. He has more than 30 years’ experience from reference measurements, proficiency testing, uncertainty evaluation, reference materials, and quality management systems. Ulf is a co-author of the Eurachem Guide ‘The Fitness for Purpose of Analytical Methods’.

Elena Sanchez has a background in laboratory quality assurance and implementation of the ISO/IEC 17025 quality standard in molecular biology laboratories. Elena has over 15 years’ experience in training and workshop facilitation.
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.

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**COURSE VENUES**

**LGC COURSES**

LGC’s courses are held at our headquarters in Teddington, south west London, which are situated close to Hampton Court Palace and the green open spaces of Bushy Park.

**LGC**
Queens Road
Teddington
Middlesex
TW11 0LY

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.

**UKAS COURSES**

The courses listed in this programme that are provided by UKAS are held at various locations. Check the listings for each training course.

**UXBRIDGE**
Denham Grove
Tilehouse Lane
Denham
Buckinghamshire
UB9 5DG

**MANCHESTER**
Mottram Hall
Wilmslow Road
Mottram
SK10 4QT

**COVENTRY**
Windmill Village Hotel
Golf Club & Spa
Birmingham Road
Allesley
Coventry
CV5 9AL

**CARDIFF**
Park Plaza Hotel
Greyfriars Rd
Cardiff
CF10 3AL

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**GROUP-BOOKING DISCOUNTS**

Analytical quality training programme 2020 | 7
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<thead>
<tr>
<th>Month</th>
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<tr>
<td>January</td>
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<td>Laboratory management – role of the quality manager and technical management</td>
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<td>Statistics for analytical scientists</td>
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<td>4-5</td>
<td>Evaluating measurement uncertainty for chemical testing laboratories</td>
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<tr>
<td></td>
<td>17-19</td>
<td>Method validation</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>Understanding ISO/IEC 17025 – requirements for analytical laboratories</td>
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<tr>
<td></td>
<td>10-11</td>
<td>Laboratory internal audit</td>
</tr>
<tr>
<td>April</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>14</td>
<td>Further statistical tools for analytical scientists</td>
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<tr>
<td></td>
<td>6-7</td>
<td>Laboratory internal audit</td>
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<tr>
<td></td>
<td>12-14</td>
<td>Laboratory management – role of the quality manager and technical management</td>
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<tr>
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<td>10-11</td>
<td>Evaluating measurement uncertainty for chemical testing laboratories</td>
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<tr>
<td></td>
<td>30</td>
<td>Method validation (Day 1)</td>
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<td>Event</td>
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<td>July</td>
<td>1-2</td>
<td>Method validation (Days 2 and 3)</td>
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<td>July</td>
<td>7-9</td>
<td>Laboratory management – role of the quality manager and technical management</td>
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<td>August</td>
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<td>September</td>
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<td>Understanding ISO/IEC 17025 – requirements for analytical laboratories</td>
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<td>Further statistical tools for analytical scientists</td>
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<tr>
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<td>1-2</td>
<td>Laboratory internal audit</td>
</tr>
<tr>
<td>December</td>
<td>1-3</td>
<td>Method validation</td>
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</table>
LGC SCHEDULED COURSES

LGC offers a programme of scheduled courses which provide training in key areas of analytical quality assurance. Full course details can be found on our website:

www.lgcgroup.com/training
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 ISO15189 laboratory accreditation standards and many other sectoral regulations and directives.

This course is primarily designed for analysts and laboratory managers in the analytical chemistry and related sectors. During the three days the course will cover the evaluation of method performance characteristics such as precision, bias, selectivity, linearity, capability of detection and ruggedness. The course will also cover essential statistical tools and their application to the analysis of validation data.

### COURSE DETAILS

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Measurement uncertainty evaluation is a requirement for laboratories accredited to ISO/IEC 17025. 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’.

This two-day course is aimed at analysts who need to be able to evaluate the uncertainty associated with their results. 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.

### COURSE DETAILS

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<td>10 – 11 June 2020</td>
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<tr>
<td>7 – 8 October 2020</td>
<td>TRMU83</td>
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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 one-day course focuses on the practical application of statistical techniques such as significance testing and linear regression, and is suitable for those with limited or no prior experience of statistics. The course includes laptop-based workshops using Excel.

### COURSE DETAILS

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<tr>
<th>Dates</th>
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<tr>
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<td>TRSTAT49</td>
<td>£525</td>
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**CONTACT US**

+44 (0)20 8943 7631
training@lgcgroup.com
www.lgcgroup.com/training
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.

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

### Course Details

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<th>Dates</th>
<th>Code</th>
<th>Price</th>
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<tr>
<td>26 November 2020</td>
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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.

This course is aimed at laboratory managers, quality managers and analysts in both accredited analytical laboratories and laboratories seeking accreditation. It covers the standard and its application in detail and includes changes introduced in the 3rd edition published in late 2017. The course will clarify concepts and terminology and demonstrate their application through practical workshops.

### Course Details

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<th>Dates</th>
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<th>Price</th>
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<td>26 March 2020</td>
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<tr>
<td>5 November 2020</td>
<td>TRISO24</td>
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</table>
ON-SITE TRAINING COURSES

The following courses can be delivered at your location. More detailed information about the courses can be found on our website. Contact us to discuss your requirements.

www.lgcgroup.com/training
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 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. 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. It also covers the statistics commonly used in PT schemes which will aid with the interpretation of PT data.

Method validation studies are essential for establishing the quality of measurement data. 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. The course will cover an introduction to method validation, evaluating method performance parameters and a validation case study.
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.

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.

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.

This two-day 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.

CONTACT US
+44 (0)20 8943 7631
training@lgcgroup.com
www.lgcgroup.com/training
UKAS COURSES

In the UK, LGC has agreed a reciprocal programme of training with UKAS. As part of this agreement, the UKAS courses listed in this brochure can be booked through LGC.
LABORATORY MANAGEMENT – ROLE OF THE QUALITY MANAGER AND TECHNICAL MANAGEMENT

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.

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. It will provide an understanding of the requirements of ISO/IEC 17025 and how to implement them.

COURSE DETAILS

<table>
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<td>Uxbridge</td>
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<td>7 – 9 July 2020</td>
<td>Coventry</td>
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<tr>
<td>22 – 24 September 2020</td>
<td>Manchester</td>
<td>TRLM56</td>
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LABORATORY INTERNAL AUDIT

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 17025:2017.

The course is suitable for anyone involved with or interested in the use of internal audits, new quality managers and new laboratory staff. The course will help attendees understand the value of internal auditing and gain confidence in performing audits.

COURSE DETAILS

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<tr>
<th>Dates</th>
<th>Venue</th>
<th>Code</th>
<th>Price</th>
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ABOUT LGC

We are a global leader in the life sciences sector, serving customers in healthcare, applied markets (including food, agbio and the environment), research and government.

We provide a comprehensive range of reference materials, proficiency testing schemes, genomics reagents and instrumentation, research and measurement services. Our scientific tools and solutions form an essential part of our customers’ quality and compliance procedures enabling them to provide safer products, develop new solutions and advance research.

Science for a safer world is at the heart of all we do.

Our origins can be traced back to 1842 when the Laboratory of the Board of Excise was founded in the City of London to regulate the adulteration of tobacco which was prohibited under the Pure Tobacco Act.

We are the UK National Measurement Laboratory for chemical and bio-measurement and have been home to the UK Government Chemist for more than 100 years.

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

For more information on the services and products we can offer visit: www.lgcgroup.com
Our terms and conditions are summarised below. Please see our website for full details:
www.lgcgroup.com/training

**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 7).

**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.