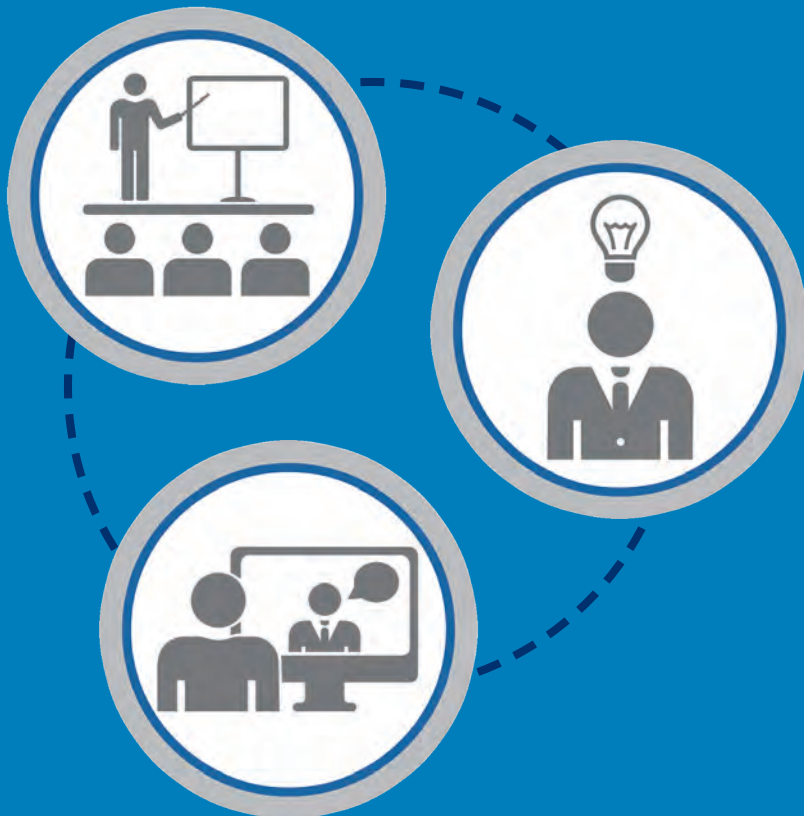




WorkPlace

Training

Course Catalog



A2LA WorkPlace Training

Your partner in measurement and quality systems.

Mission: *Provide independent, world-class training programs that inspire confidence in the quality of service and acceptance of results from organizations.*

A2LA WorkPlace Training (A2LA WPT) promotes a learning environment that cultivates the transfer of information, encourages knowledge through discipline, and stimulates improvement through understanding. This stairstep approach builds durable confidence in the learner and the beneficiaries of their work. A2LA WPT's training program provides adult learners with not only the information necessary to understand the material, but also the tools to effectively apply the information and verify conformance to corporate standards and objectives.

Evolution of the art and science of instructional design and adult learning principles continues, in part due to ever-increasing modes and rapidity of information delivery (e.g. webinars, sound bites, tweets, podcasts, newscasts, and e-learning) that serve as tools for gathering information and developing skills by multi-generational learners. A2LA WPT fully embraces digital delivery and innovative instructional design methods and is transforming itself by adding consulting, coaching, and mentoring platforms.

A2LA WPT is developing not only learning paths, but also follow-up activities ensuring your knowledge is correctly applied. Learning paths include blended learning events (combinations of e-learning, webinars, virtual and instructor-led training) to accommodate work-life balance and availability of learning time to achieve a career path that suits your goals. Digital learning establishes the foundational knowledge necessary to capitalize on the benefits of virtual and instructor-led events. Several students who have taken our public and e-learning courses have inquired about moving from a basic level of knowledge and some application to analysis and evaluation. This is accomplished through two methods: 1) adding industry-specific exercises in the instructor-led and virtual courseware, and 2) consulting and coaching activities where we can customize and apply techniques directly to the learner's current needs (see page 32 within this catalog that amplifies this product offering). We have also embraced a mentoring option using SMEs to clarify and elaborate on principles and concepts in our products. This option is called OJT (On-the-Job Training) Mentor.

Thank you for attending and for reaffirming that our offerings are "top-notch" through your feedback and testimonials. If you have never attended, let the testimonies on our website be an encouragement to you to register and to learn from our subject matter experts.

Sincerely,

The Training Team



"All knowledge is the outcome of obedience, everything else is just information."

~Nee T'o-sheng

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Why A2LA WorkPlace Training?

A2LA WPT utilizes people who:

- ▶ Embrace the same values A2LA WPT holds;
- ▶ Engage people because of their own enthusiasm;
- ▶ Foster a passion for learning;
- ▶ Maintain competence in their disciplines; and
- ▶ Contribute to industry development.



Why E-Learning?

Our e-learning courses and workshops are based on accepted industry calibration practices. Detailed examples are included to educate, demonstrate, promote, and reinforce best measurement practices.

Our training presents technical information and best practices relevant to new hire training, cross and refresher training, or establishing a baseline proficiency level. Auditors prefer concise training records and documentation.

Measurement instrument users must be proficient at identifying, interpreting, and applying appropriate specifications in their processes. Instrument specifications should provide adequate details about performance characteristics for a representative group of devices or items (e.g., manufacturer/model). This information should be reported in a logical format, using consistent terms, abbreviations, and units that clearly convey pertinent parameters or attributes. Given the complexity of present-day measuring equipment and instruments there is a need for highly trained technicians. In fact, industry standards require it.

What separates A2LA WorkPlace Training instructors from other training institutions?

A2LA WPT instructors are:

- ▶ Technical industry leaders, practitioners and consultants;
- ▶ Thought leaders and innovators in their sectors;
- ▶ Members of Standards Development Organizations (ISO, ASTM, IEEE, etc.); and
- ▶ Leaders in regulatory development.

What value does all of this bring to you?

A2LA WPT benefits:

- ▶ **Accreditation:** Independent review of our training program by IACET;
- ▶ **Application:** Technical experts discuss current applications and deliver pertinent exercises that are instantly deployable in your organization;
- ▶ **Breadth:** Maintain a broad cross-section of courses to equip you to deliver the best product possible;
- ▶ **Content:** More information and experience per event for the cost than any other comparable training institutions; and
- ▶ **Presence*:** Instructor-led training sessions throughout the world so you can minimize travel and costs.

**Contact us if you would like us to perform training at your facility – [A2LAWPT.org/customize](https://www.A2LAWPT.org/customize).*

A2LA WorkPlace Training's Focus on Competency - Based Learning & Continuous Education

What is Competency-Based Learning?

Competency-based learning (CBL) achieves the following goals:

- ▶ Align with personal, organizational, and industry goals;
- ▶ Maximize knowledge, skills, and abilities for the money invested; and
- ▶ Increase employee engagement.

CBL is used by A2LA WPT in managing its content development ensuring learners achieve their goals and objectives and departs the training event with the appropriate knowledge and skills to improve their performance and elevate its organizational performance.

We offer both CEUs and LEUs as demonstration of competency.

What is a CEU?

The Continuing Education Unit (CEU) was created by IACET as a measurement of continuing education.

A CEU is not a CTU (Continuous Training Unit) or other unit of educational measure because CEUs require an independent review of the training management system and instructor competency by an accredited organization.

In offering CEUs, A2LA WPT Training chooses to provide you the best product available in the market so that you are successful.

Benefits of CEUs?

Many professional organizations and societies require CEUs as a demonstration of personnel proficiency and development. The goal is to ensure that their members remain current on processes, systems, and technology.

Who is IACET?

The International Association for Continuing Education and Training (IACET) is a non-profit association dedicated to adult learning through instructional systems design (ISD). IACET's mission is to advance the global workforce by providing the standard framework for quality learning and development through accreditation.



IACET accredits education and training service providers to a set of strict continuing education guidelines, namely the ANSI/IACET 1-2018 Standard, which is built upon in-depth research on the learning process and serves as the backbone for thousands of educational programs worldwide. IACET recognition is the standard learners seek for quality when they choose a continuing education and training provider.

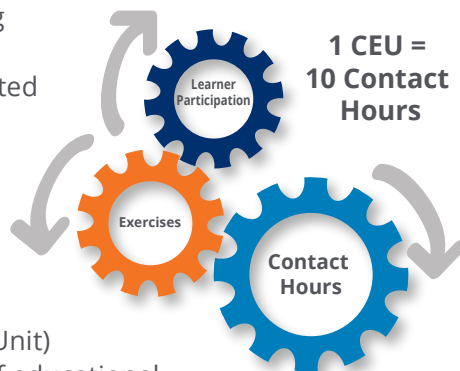
A2LA WPT has pledged its continued conformance with the IACET Standard (our certificate can be found on the IACET website) (<https://www.iacet.org/resources/accredited-providers-list/>) and is recognized as offering the highest quality continuing education and training programs.

Why IACET?

In keeping with A2LA WPT's values, mission, and vision, A2LA WPT believes independent assessment is critical in keeping customer satisfaction and product quality at its best. IACET's reputation in the adult learning environment made choosing them the easiest decision in the process of training and education accreditation. Since our accreditation, we continuously receive accolades on training content, delivery and quality of the trainers.

What is an LEU?

The A2LA WorkPlace Training Learner Education Unit (LEU) is our company assurance of quality for competency-based learning. Our courses maintain IACET principles and trainer competencies, while allowing for more delivery flexibility than standard IACET recognized courses. Using this method, we are able to create a unique learning experience for our participants.



Try us out and see for yourself!



International Standards Courses

ISO/IEC 17025:2017 Bridging the Gap from 2005 (MS 110)

1 Day | CEUs: 0.7 | 🧑🏫 | ✓

Target Learner: Testing/Calibration Laboratory Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: This course is an overview of the changes made to ISO/IEC 17025 in its latest revision. In this course, the participant will become aware of the significant and subtle changes to existing ISO/IEC 17025 laboratory systems, as well as the necessary steps to ensure conformity to the new standard.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Describe the process-based approach of the Standard;
2. Explain new concepts in ISO/IEC 17025:2017 such as:
 - a. Continuous Improvement (using PDCA and KPIs);
 - b. Verification and Validation;
 - c. Decision Rules;
 - d. Principles of Impartiality; and
 - e. Risk-Based Thinking.
3. Analyze scenarios to identify non-conformities, risks, and opportunities related to the new requirements in the standard; and
4. List the areas where documents and records are required under the new standard.

Prerequisites: Attendees should have at least three to four years of experience with ISO/IEC 17025:2005 before attending this course.

Equipment/Materials: Attendees are provided a watermarked copy of ISO/IEC 17025:2017 for training use only. It is not considered legal copy for ownership purposes.

Understanding ISO/IEC 17025:2017 for Testing & Calibration Laboratories (MS 111)

2 Days | CEUs: 1.4 | 🧑🏫 | ✓

Target Learner: Testing/Calibration Laboratory Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: This course is a comprehensive review of the philosophies and requirements of ISO/IEC 17025:2017. The participant will gain an understanding of conformity assessment using the risks and opportunities-based approach.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Describe the process-based approach of the standard;
2. Explain new concepts in ISO/IEC 17025 such as:
 - a. Continuous Improvement (using PDCA and KPIs);
 - b. Verification and Validation;
 - c. Decision Rules;
 - d. Principles of Impartiality; and
 - e. Risk-Based Thinking.
3. Analyze scenarios to identify non-conformities, risks, and opportunities related to the new requirements in the standard;
4. Analyze sample calibration records to demonstrate metrological traceability; and
5. List the areas where documents and records are required under the new standard.

Prerequisites: None

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17025:2017 standard will be provided to each participant.



Understanding ISO/IEC 17025:2017 and AOAC Food Program Guidelines (MS 112)

2 Days | **CEUs:** 1.4 | |

Target Learner: Food/Pharmaceutical Laboratory Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: This course focuses on the application of the ISO/IEC 17025 requirements and the AOAC International Guidelines for Laboratories Performing Microbiological and Chemical Analyses of Food, Dietary Supplements Requirements, in an accredited food testing laboratory setting.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Describe the process-based approach of the standard;
2. Explain new concepts in ISO/IEC 17025:2017 such as:
 - a. Continual Improvement (using PDCA and KPIs);
 - b. Verification and Validation;
 - c. Decision Rules;
 - d. Principles of Impartiality; and
 - e. Risk-Based Thinking.
3. Analyze scenarios to identify non-conformities, risks, and opportunities related to the new requirements in the standard;
4. Analyze sample calibration records to demonstrate metrological traceability;
5. List the areas where documents and records are required under the new standard; and
6. Describe the specific calibration and verification requirements of the AOAC Program.

Prerequisites: None, although familiarity with ISO/IEC 17025:2005 and/or the previous version of the AOAC program requirements may be beneficial.

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17025:2017 standard and AOAC Accreditation Guidelines for Laboratories document will be provided to each participant.

Introduction to ISO/IEC 17025 for Technicians (MS 111-E)

10 Hours | **LEUs:** 1 | | | |

Target Learner: Testing/Calibration Laboratory Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: This self-directed online course focuses on the requirements of ISO/IEC 17025, how it is applied to calibration and test laboratories, and identifies key information that pertains to technicians who work in an accredited lab. Participants will gain a thorough understanding of the topics illustrated in the standard and will learn the requirements, activities and documented information that demonstrate conformance to the international standard.

Key Topics:

- ▶ Audits and Auditors
- ▶ The Assessment Process
- ▶ After the Assessment
- ▶ Internal Assessments

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.



ISO/IEC 17025:2017 for Cannabis Testing Laboratories (MS 113)

2 Days | CEUs: 1.4 | 🧠 | ✅

Target Learner: Cannabis Testing Laboratory Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: Throughout this course, participants from the cannabis industry (e.g. growers, regulators, testing laboratories) will learn how and why the new ISO/IEC 17025:2017 standard applies to them and how accreditation improves the visibility, credibility, and safety of the cannabis industry. This course is presented for the benefit of all industry stakeholders, however, its basis is for application in cannabis testing facilities.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Describe the process-based approach of the standard;
2. Explain new concepts in ISO/IEC 17025:2017 such as:
 - a. Continual Improvement (using PDCA and KPIs);
 - b. Verification and Validation;
 - c. Decision Rules;
 - d. Principles of Impartiality; and
 - e. Risk-Based Thinking.
3. Analyze scenarios to identify non-conformities, risks, and opportunities related to the new requirements in the standard;
4. Analyze sample calibration records to demonstrate metrological traceability; and
5. List the areas where documents and records are required under the new standard.

Prerequisites: None

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17025 standard will be provided to each participant.



ISO/IEC 17020:2012 & Inspection Body Accreditation (MS 120)

2 Days | CEUs: 1.4 | 🧠 | ✅

Target Learner: Inspection Body Directors, Managers, Auditors, or Engineers

Description: This course provides the participant with a comprehensive look at ISO/IEC 17020 and its requirements for inspection bodies. Participants will gain critical insight into the application of the requirements of this international standard. Participants will also be introduced to the international Mutual Recognition Arrangements (MRA) requirements that affect accredited inspection bodies.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Define critical terminology for inspection bodies;
2. Identify the documents and records required;
3. Model the steps in the accreditation process;
4. Analyze scenarios to determine conformance with requirements from the standard; and
5. Recognize and summarize the international MRA requirements that affect accredited inspection bodies.

Prerequisites: None

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17020:2012 standard will be provided to each participant.



Understanding ISO 17034:2016 for Reference Material Providers (MS 130)

2 Days | CEUs: 1.4 | | |

Target Learner: Reference Material Producer Directors, Managers, Auditors, Engineers, Scientists, or Technicians

Description: This course provides the participant with a comprehensive look at the requirements of ISO 17034, as well as associated definitions from ISO Guide 30, requirements for statistical methods from ISO Guide 35, and requirements for accompanying descriptive information from ISO Guide 31.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify the documents and records required;
2. Discuss the difference between Reference Materials (RMs) and Certified Reference Materials (CRMs);
3. Define characterization, homogeneity, stability, and uncertainty;
4. Relate the need for characterization, homogeneity, stability and uncertainty for all types of reference materials;
5. Design and plan production for an example reference material; and
6. Analyze files and records to determine conformance with the requirements for content of reference material documentation.

Prerequisites: Expertise in a technical field of measurement where reference materials are used or needed.

Equipment/Materials: A legal, authorized copy of the ISO 17034 standard will be provided to each participant.

Understanding ISO/IEC 17043:2010 & Statistical Analysis for Proficiency Testing Providers (MS 140)

2 Days | CEUs: 1.4 | | |

Target Learner: Proficiency Testing Provider Directors, Managers, Auditors, or Staff

Description: This course provides the participant with a comprehensive look at proficiency testing (PT), including the design and operation of PT schemes, statistical methods, reporting, and interpretation. The participant will gain an understanding of the requirements of ISO/IEC 17043 and ISO 13528, and will be presented with tools for basic statistical design and data analysis.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify the documents and records required;
2. Categorize scenarios as "proficiency testing" or "other" using the ISO standard definition;
3. Practice statistical methodologies for designing and analyzing a proficiency testing scheme;
4. Analyze sample reports for conformity to ISO requirements; and
5. Build an optimal statistical design for the objectives of a proficiency testing scheme.

Prerequisites: Expertise in a technical field of measurement where proficiency testing is used or needed.

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17043:2010 and ISO 13528 standards will be provided to each participant.



Understanding ISO/IEC 17065:2012 for Product Certifiers (MS 160)

1.5 Days | CEUs: 1.0 | 🧠 | ✓

Target Learner: Certification Body Directors, Managers, Auditors, or Staff

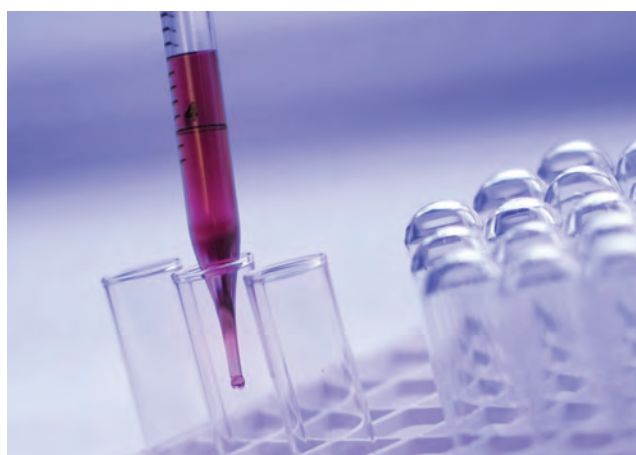
Description: This course provides the participant with a comprehensive look at the requirements of ISO/IEC 17065, regardless of the certification scheme being operated. Additionally, participants will have the opportunity to ask questions about the guidance offered by ISO/IEC 17065 to assist in the creation and maintenance of a certification scheme.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify the documents and records required;
2. Recognize and summarize the differences between the ILAC Mutual Recognition Arrangement (MRA) and IAF Multilateral Recognition Arrangement (MLA), and how these international agreements affect accredited product certifiers;
3. Discuss how certification schemes provide different frameworks for product certifier operations;
4. Model the steps in the certification process; and
5. Analyze a product certification scheme and determine the specific requirements placed on a product certification body.

Prerequisites: None. However, some familiarity with ISO/IEC 17025, 17020, and/or 17021-1 might be helpful.

Equipment/Materials: A legal, authorized copy of the ISO/IEC 17065:2012 standard will be provided to each participant.



Understanding ISO 15189:2012 & CLIA Requirements for Medical Laboratories (MS 170)

2 Days | CEUs: 1.4 | 🧠 | ✓

Target Learner: Clinical Testing Laboratory Directors, Managers, Auditors, Scientists, or Technicians

Description: During this course, the participant will gain an understanding of the ISO 15189 and CLIA requirements and benefits through discussion, interactive exercises, and lecture. The participant will also be introduced to a new risk-based initiative recently introduced by CMS: the IQCP, or Individualized Quality Control Plan.

Learning Outcomes: After successful completion of this course, the participant will be able to:

1. Identify documents and records required by the standard and CLIA;
2. Implement actionable clauses;
3. Design and apply a risk management system;
4. Recognize how and when to implement an IQCP; and
5. Describe the benefits of the standard in conjunction with CLIA requirements.

Prerequisites: None

Equipment/Materials: A legal, authorized copy of the ISO 15189:2012 standard and the CLIA Requirements Document will be provided to each participant.



Understanding ISO 20387:2018 General Requirements for Biobanking (MS 180)

3 Days | CEUs: 2.1 | 🧑 | ✍️ | ✅

Target Learner: Biobanking Laboratory Directors, Managers, Auditors, Scientists, or Technicians

Description: During this course, the participant will gain an understanding of ISO 20387 through discussion, evaluation and practical application of the requirements for competent biobank operation and provision of quality biological material/associated data for research and development purposes.

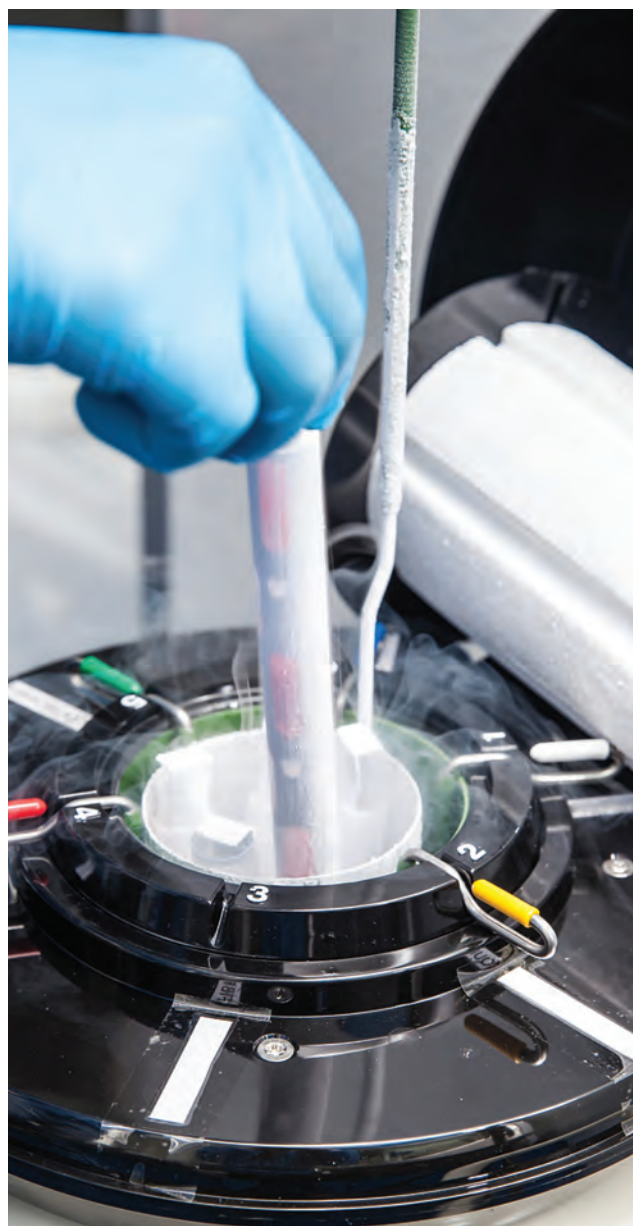
Learning Outcomes: During this training event, the participant will:

1. Identify:
 - a. Types of biobanking activities
 - b. Keywords leading to a document, record, or action
 - c. Risks to data management
 - d. Quality management system components
2. Discuss:
 - a. Key terms
 - b. Types of governance bodies
 - c. Biobanking funding strategies
 - d. Critical equipment
 - e. Validation and verification
 - f. Process requirements
3. Evaluate:
 - a. Competence & training requirements
 - b. Criteria for internal and external biobanking products & services
 - c. Life cycle workflow
 - d. Metrological traceability
4. Practice:
 - a. A vertical audit on various biobanking activities (collection, reception, distribution, transport, traceability, preparation, storage, quality control)

Prerequisites: None, however familiarity with biobanking practices is recommended.

Equipment/Materials: A legal, authorized copy of the ISO 20387:2018 standard will be provided to each participant.

Exam: Includes graded exam at end of course, passing score 70%





Management Systems Courses

Documenting Your ISO/IEC 17025 Management System (AUD 100)

1 Day | CEUs: 0.7 |

Target Learner: Laboratory Managers, Auditors, or Quality Personnel

Description: During this course, the participant will gain an understanding of the basic concepts of management system documentation structure, content, and development. The participant will also practice developing processes, standard operating procedures, and applying mechanisms needed to control, review, and update documents on an ongoing basis.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify terms used in conformity assessment standards which refer to a "document";
2. Define and differentiate document terms;
3. Identify requirements for documents;
4. Define the sources of input (clients) and input requirements for developing the documents;
5. Identify and evaluate the risks associated with the process;
6. Establish key objectives and monitoring tools to ensure success in implementation of the document;
7. Employ document writing and control techniques; and
8. Describe different document design formats, including LIMS.

Prerequisites: Oral and written communication skills and experience with applying management systems processes.

Equipment/Materials: None

Managing Risk in Laboratory Processes (AUD 101)

1 Day | CEUs: 0.7 |

Target Learner: Laboratory Managers or Auditors

Description: This course introduces the participants to risk-based thinking from an international standards perspective. The participant will learn risk concepts from ISO 31000 and ISO 9000 and become familiar with industry tools used to assess and manage risk in the ISO conformity assessment arena.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. From memory, identify and describe the three components identified in ISO/IEC 17025 that drive customer confidence;
2. Given a diagram of the Process Approach, describe the components;
3. Define risk;
4. Describe the 3 components for risk assessment;
5. Identify the 4 phases of risk management; and
6. Given various tools for identifying and evaluating risk, apply the tools under given scenarios.

Prerequisites: None

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Auditing Your Laboratory to ISO/IEC 17025:2017 (AUD 102)

2 Days | CEUs: 1.4 | | |

Target Learner: Laboratory Managers or Auditors

Description: This course will introduce participants to ISO 19011, the guideline for auditing management systems as applied to ISO/IEC 17025. The participant will learn about auditing principles and develop skills for performing higher-value internal audits. The course includes hands-on exercises for planning, establishing, implementing and maintaining an audit program, and focuses on developing auditing methods, questioning techniques, and record-sampling.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Apply the guidance in ISO 19011 to construct an effective audit program and plan;
2. Relate the benefits and drawbacks of various types of audit plans and methods;
3. Evaluate sample audit findings and relate them to ISO/IEC 17025 requirements to plan additional investigation avenues;
4. Review sample management system documents and records to determine conformity with requirements;
5. Practice the interpersonal skills needed to effectively gather information; and
6. Assemble, present, and defend clear audit findings based on presented scenarios.

Prerequisites: Must understand the full context of the ISO/IEC 17025:2017 standard, either via A2LA WPT training courses or experience operating and/or auditing a laboratory conforming to ISO/IEC 17025:2017 requirements.

Equipment/Materials: Attendees must bring their own copy of ISO/IEC 17025:2017 and ISO 19011:2018. Exercises will focus on the requirements of the standard and the techniques in the guidance document. Copies will not be provided.

Improving the Corrective Action Process (AUD 103)

1 Day | CEUs: 0.6 | |

Target Learner: Laboratory Managers, Auditors, or Technicians

Description: This course provides participants with tools to react more successfully to non-conforming events in their organizations. Participants will identify and analyze non-conforming scenarios using a variety of techniques and will practice using various cause analysis and corrective action selection processes to support process improvement.

This course supplements, and is supplemented by, the "Managing Risk in Laboratory Processes" course also offered by A2LA WPT. When combined with robust understanding of ISO/IEC conformity assessment standards, these three courses should allow an attendee to excel at preventing most common non-conformities and effectively reacting to those few incidents which "slip through the cracks" of their organization's management systems.

Learning Outcomes: After successful completion of this course, participants will be able to:

1. Differentiate between corrections and corrective actions;
2. Implement steps for carrying out effective cause analysis;
3. Select from and apply various tools that support cause analysis;
4. Support and critique cause-analyses carried out by others; and
5. Implement and monitor appropriate corrective actions.

Prerequisites:

1. Attendees should have familiarity with ISO/IEC requirements, especially those for handling non-conforming work and corrective actions and have a basic understanding of process improvement concepts.
2. It might be beneficial for attendees to also attend, or have attended, A2LA WPT's "Managing Risk in Laboratory Processes" course (AUD101), which presents a proactive view on preventing non-conformities, while this course provides a reactive view.

Equipment/Materials: None



Assessment to Requirements of ISO/IEC 17025 (AUD 104-E)

10 Hours | LEUs: 1 |  |  |  |  | 

Target Learner: Laboratory Managers, Auditors, or Technicians

Description: This self-directed online course provides a comprehensive look at ISO/IEC 17025:2017 and its requirements from an auditing perspective. Participants will gain critical insight on how to properly apply the requirements of this laboratory standard and participate in a review of the typical third-party accreditation process.

Key Topics:

- ▶ Audits and Auditors
- ▶ The Assessment Process
- ▶ After the Assessment
- ▶ Internal Assessments

Prerequisites: Introduction to ISO/IEC 17025 for Technicians (MS 111-E) is a prerequisite to this course.

Equipment/Materials: This e-learning course requires internet access to complete.



Leading an Effective ISO/IEC 17025 Audit Team (AUD 201B)

4 Days | CEUs: 2.8 |  |  |  |  |  | 

Target Learner: Laboratory Managers, Lead Auditors, or Auditors

Description: This is a blended learning course that begins with a focus on the ISO/IEC 17025 standard requirements in an e-learning course completed online at the learner's own pace. Live instruction follows with an introduction of internal audit philosophies and applying the auditing techniques of ISO 19011 to the requirements of ISO/IEC 17025. The participant will receive hands-on training as an internal auditor reviewing ISO/IEC 17025 conformant systems using scenarios common to testing and calibration laboratories.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. From memory, describe the steps required for an internal audit;
2. Apply the guidance in ISO 19011 to design an effective audit program;
3. Relate the benefits and drawbacks of various types of audit plans and methods;
4. Given a copy of ISO/IEC 17025:2017 and a series of sample management system documents and records and audit findings, complete the following:
 - a. Establish the context of an audit;
 - b. Perform a document review and identify amplifying questions to demonstrate system conformance; and
 - c. Construct an effective audit plan.
5. Practice the skills for effective information gathering;
6. Given several scenarios and mock events, evaluate the applications of ISO/IEC 17025 and competency of internal auditors; and
7. Assemble, present, and defend clear audit findings based on presented scenarios.

Prerequisites: None

Equipment/Materials:

A copy of the ISO 19011:2018 standard will be provided to each attendee and is considered a legal copy for the attendee to take home.

Copies of ISO/IEC 17025:2017 are not distributed during this course, but attendees are encouraged to bring their own copy for reference.

Exam: Includes graded exam at end of course, passing score 70%

ISO/IEC 17025:2017 Marcando la Diferencia con la Versión 2005 (MS 110S)

1 Día | **CEUs:** 0.7 | |

Público objetivo: Directores de laboratorio, gerentes, auditores, ingenieros, técnicos de laboratorio de pruebas / calibración

Descripción del curso: Este es un curso de un día de visión general de los cambios hechos a la Norma ISO/IEC 17025, en su última revisión. En este curso, el participante conocerá los cambios significativos y sutiles al existente sistema de laboratorio ISO/IEC 17025, así como los pasos necesarios a seguir para asegurar la conformidad con la nueva Norma.

Los resultados del aprendizaje: Después de completar exitosamente el curso, el participante estará en capacidad de:

1. Describir el enfoque basado en procesos;
2. Explicar nuevos conceptos tales como:
 - a. Proceso PHVA (PDCA) con identificación y mitigación de Riesgos/Oportunidades;
 - b. Verificación y Validación;
 - c. Reglas de Decisión; y
 - d. Principios de Imparcialidad;
3. Identificar áreas de Riesgos y Oportunidades para la Mejora; y finalmente
4. Implementar adecuadamente las cláusulas de la Norma.

Requisitos previos:

1. (MS 101) ISO/IEC 17025:2005 y Acreditación de Laboratorios; o
2. Experiencia trabajando en un Sistema de Gestión acreditado.

Equipo / Materiales: A los asistentes se les proporciona una copia con marca de agua de la Norma ISO/IEC 17025:2017, solo para uso de capacitación. Esta no es considerada una copia legal para fines de propiedad.

Comprensión ISO/IEC 17025:2017 (MS 111S)

2 Días | **CEUs:** 1.4 | |

Público objetivo: Directores de laboratorio, gerentes, auditores, ingenieros, técnicos de laboratorio de pruebas / calibración

Descripción del curso: Este curso incluye una revisión exhaustiva, así como una exposición de los principales conceptos y de los requisitos de esta Norma Internacional.

El participante estará en capacidad de comprender la evaluación de la conformidad utilizando el enfoque basado en los riesgos y las oportunidades.

Los resultados del aprendizaje: Después de completar exitosamente el curso, el participante estará en capacidad de:

1. Describir el enfoque basado en procesos;
2. Explicar nuevos conceptos tales como:
 - a. Proceso PHVA (PDCA) con identificación y mitigación de Riesgos/Oportunidades;
 - b. Verificación y Validación;
 - c. Reglas de Decisión;
 - d. Principios de Imparcialidad; y
 - e. Pensamiento basado en el riesgo
3. Identificar áreas de Riesgos y Oportunidades para la Mejora;
4. Enlistar las áreas en las que la nueva Norma requiere procedimientos y registros; y finalmente
5. Implementar adecuadamente las cláusulas de la Norma.

Requisitos previos: None

Equipo/Materiales: Se proporcionará a cada participante una copia legal autorizada en español de la Norma ISO/IEC 17025:2017.

Gestión del riesgo en los procesos de laboratorio (AUD 101S)

1 Día | CEUs: 0.7 | 🧠

Público objetivo: Directores de laboratorio, gerentes, auditores, ingenieros, técnicos de laboratorio de pruebas / calibración

Descripción del curso: Este curso introduce a los participantes al pensamiento basado en el riesgo desde una perspectiva de normas internacionales. El participante aprenderá conceptos de riesgo de ISO 31000 e ISO 9000 y se familiarizará con herramientas de la industria utilizadas para evaluar y gestionar el riesgo en el ámbito de la evaluación de la conformidad ISO.

Resultados del Aprendizaje: Después de completar con éxito el curso, el participante podrá:

1. De memoria, identificar y describir los tres componentes identificados en ISO/IEC 17025 que impulsan la confianza del cliente;
2. Dado un diagrama del Enfoque de Procesos, describir los componentes;
3. Definir el riesgo;
4. Describir los 3 componentes para la evaluación del riesgo;
5. Identificar las 4 fases de la gestión de riesgos; y
6. Dadas las diversas herramientas para identificar y evaluar el riesgo, aplicar las herramientas en escenarios dados.

Requisitos previos: Ninguno

Equipo/Materiales: Los participantes deben traer computadoras portátiles con una aplicación de hoja de cálculo, como Excel.



Auditando su laboratorio con la Norma ISO/IEC 17025:2017 (AUD 102S)

2 Días | CEUs: 1.4 | 🧠 | 📄 | ✅

Público objetivo: Directores de laboratorio, gerentes, auditores, ingenieros, técnicos de laboratorio de pruebas/calibración

Descripción del curso: Este curso introduce a los participantes a la norma ISO 19011, directriz para la auditoría de los sistemas de gestión aplicada a la norma ISO/IEC 17025. El participante aprenderá acerca de los principios de auditoría y desarrollará habilidades para realizar auditorías internas de mayor valor. El curso incluye ejercicios prácticos para planificar, establecer, implementar y mantener un programa de auditoría, y se enfoca en el desarrollo de métodos de auditoría, técnicas de entrevista y muestreo de registros.

Resultados del Aprendizaje: Después de completar con éxito el curso, el participante podrá:

1. Aplicar las orientaciones de la norma ISO 19011 para construir un programa y un plan de auditoría eficaces;
2. Relacionar los beneficios y desventajas de diferentes tipos de planes y métodos de auditoría;
3. Evaluar una muestra de hallazgos de auditoría y relacionarlos con los requisitos ISO/IEC 17025 para planificar líneas de investigación adicionales;
4. Revisar una muestra de documentos y registros del sistema de gestión de muestras para determinar la conformidad con los requisitos;
5. Practicar las habilidades interpersonales necesarias para recopilar información de manera efectiva; y
6. Recopilar, presentar y defender de forma clara los resultados de auditoría, basados en los escenarios presentados.

Requisitos previos: Debe comprender el contexto completo de la norma ISO/IEC 17025:2017, ya sea a través de cursos de formación con A2LA WPT o experiencia de operación y/o auditoría de un laboratorio conforme a los requisitos ISO/IEC 17025:2017.

Equipos/Materiales: Los asistentes deben traer su propia copia de ISO/IEC 17025:2017 e ISO 19011:2018. Los ejercicios se centrarán en los requisitos de la norma y las técnicas del documento de orientación. No se proporcionarán copias.



General

Basic Statistics for Laboratory Professionals (EMU 100)

1 Day | LEUs: 0.7 | | |

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This is an introductory course designed to provide participants with a foundation to the fundamental concepts of statistics. Statistical concepts and methods are presented in a way that emphasizes understanding of the principles of data collection and analysis.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify, explain, and recognize key terms, definitions, and reference sources related to statistics;
2. Use spreadsheets to perform basic statistical calculations; and
3. Summarize the relationship between statistics and measurement uncertainty.

Prerequisites: Participants should be familiar with basic spreadsheet mathematical functions.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Introduction to Measurement Uncertainty (EMU 101)

1 Day | LEUs: 0.7 | | |

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This course is a suitable introduction for both calibration and testing laboratory participants and focuses on the concepts and mathematics of the measurement uncertainty evaluation process. The participant will gain an understanding of the statistical techniques required to estimate measurement uncertainty and will practice those skills to create basic uncertainty budgets.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify, explain, and recognize key terms, definitions, and reference sources related to statistics;
2. Understand and implement basic statistics;
3. Describe and apply various statistical and non-statistical distributions; and
4. Illustrate simple uncertainty budgets.

Prerequisites: Participants should be familiar with statistical functions in spreadsheets. A working understanding of mathematics and statistics will clarify the math presented in this course.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Measurement Uncertainty

(EMU 101-E)

15 Hours | LEUs: 1.5 |    

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Course Description: This self-directed online course is designed to instruct and evaluate the user on concepts of measurement uncertainty. Because uncertainty applies in specific ways to all types of measurement, this course will focus on how to analyze, express, and account for uncertainty in general, and why these concepts are important to maintaining the quality of measurements and ultimately reducing uncertainty.

Key Topics:

- ▶ Essentials of Expressing Measurement Uncertainty
- ▶ Specification
- ▶ Risk Analysis Introduction
- ▶ Statistical Tools & Software
- ▶ Standards

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.

ISO/IEC Conformance: Uncertainty Management (EMU 102-E)

10 Hours | LEUs: 1.0 |    

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

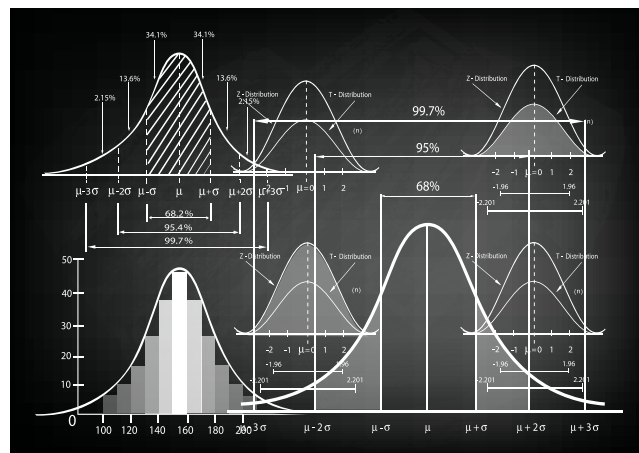
Course Description: This self-directed online course provides a detailed perspective on the concept of uncertainty management as it pertains to ISO/IEC 17025. Participants will gain a thorough understanding of specifications, tolerances, measurement uncertainty, and reporting requirements all of which are central to demonstrating conformance to the requirements of ISO/IEC 17025.

Key Topics:

- ▶ Measurement Uncertainty Accreditation
- ▶ Specifications
- ▶ Tolerances and Uncertainty
- ▶ Changes to and Adjustment of Decision Rules

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.



Evaluating Continuous Improvement Efforts using Measurement Systems Analysis (EMU 110)

2 Days | LEUs: 1.4 |   

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Course Description: This course provides the participant with essential tools to be efficient in laboratory operations, including making continual measurement process improvements in the calibration and testing environment. Industry-proven statistical tools such as Statistical Process Control (SPC), False Accept Risk, Hypothesis Testing and others are covered.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Apply tools and techniques learned during the course to their measurement processes;
2. Employ the statistical capability of spreadsheet applications;
3. Identify and utilize supplemental tools for determining Type A measurement uncertainty (repeatability and reproducibility); and
4. Demonstrate techniques for calibration interval analysis and other improvements to the measurement process.

Prerequisites: Participants should be familiar with statistical functions in spreadsheets and able to apply basic measurement uncertainty evaluation/estimation principles (Introduction to Measurement Uncertainty EMU 101).

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Proficiency Testing (EMU 120-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Laboratory Managers

Description: This self-directed online course covers information that laboratory management personnel need to conduct a better measurement assurance program and improve the outcome of proficiency testing. This includes a section on the interpretation of proficiency testing data provided by proficiency testing providers. The information in this course ensures that the laboratory will be able to provide explanations of proficiency testing results to its customers and to meaningfully address the results provided by the proficiency testing provider.

Key Topics:

- ▶ Standards and Documents Associated with Proficiency Testing
- ▶ Related Basic Statistics
- ▶ Proficiency Testing Schemes (with examples)
- ▶ Data Interpretation

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete. Proficiency testing calculator tool is provided with course materials.

Introduction to Analytical Measurement (EMU 130-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This course introduces analytical measurement concepts that lay the foundation for a variety of analytical industry segments, including chemical, biotechnology, environmental, and forensics. It covers relevant mathematics, common error sources, the operation of principle measurement devices, and further key concepts derived from the Eurachem document "Terminology in Analytical Measurement – Introduction to VIM 3".

Key Topics:

- ▶ Introduction to Metrology Terms
- ▶ Metrological Traceability
- ▶ Measurement Uncertainty
- ▶ Validation and Method Performance

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.





Introduction to Control Charting for Testing & Calibration Laboratories

(EMU 150)

1 Day | **LEUs:** 0.7 |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: Control charting, a graphical presentation of measurement process behavior, is an exceptionally powerful statistical tool that is easy to learn. The benefits to control charting include confidence in the stability of measurement process, rapid detection of large upsets, ability to detect trends, insight into process behavior, and improved estimation of measurement uncertainty. A well-designed control charting program is one of many tools that can be used to ensure the customer receives valid measurement results. Participants of this course will develop an understanding of basic control charting concepts, implement these concepts to build various control charts (I/MR, Xbar/R and Xbar/S), and evaluate measurement process stability.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Describe Statistic Process Control (SPC) concepts of a measurement process;
2. List control chart parameters;
3. Select and create appropriate control charts for a given application;
4. Interpret control chart and determine process stability;
5. Describe stages of control chart implementation; and
6. Update control limits.

Prerequisites: None

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.

Intermediate Statistics for Laboratory Professionals

(EMU 200)

2 Days | **LEUs:** 1.4 |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This course reviews concepts of random processes, distributions, and statistical estimation. Participants will learn basic concepts of statistical testing, methods of testing means and variances, and review examples where this would be used in the laboratory. Participants will learn basics of regression and apply them to calibration and testing results to demonstrate linearity. All topics are tied together by considering estimation of limits of detection (LOD) and limits of quantitation (LOQ).

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify null and alternative hypothesis;
2. Construct a hypothesis test for mean vs fixed value, comparing 2 means, comparing 2 variances and interpret results;
3. Create a scatterplot and visually determine a potential relationship between 2 variables;
4. Determine and interpret the slope and intercept for a given linear regression equation;
5. Evaluate the variance vs. concentration relationship for calibration data;
6. Use regression analysis to test for multiplicative and additive bias; and
7. Understand the concepts for determining LOD and LOQ using regression-based techniques.

Prerequisites: Basic Statistics for Laboratory Professionals (EMU 100) or equivalent knowledge.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Interval Analysis (EMU 200-E)

10 Hours | LEUs: 1.0 |  |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This self-directed online course focuses on concepts associated with calibration intervals and interval analysis, specifically to determine the correct calibration interval necessary to maintain measurement quality over a time interval. The information in this course will enable the equipment user to make the periodic adjustments needed to produce measurements with a high degree of confidence.

Key Topics:

- ▶ Concepts of Interval Analysis
- ▶ Basic Statistics & Statistical Techniques
- ▶ Reliability Models
- ▶ Calibration interval Analysis

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete. Interval analysis calculator tool is provided with course materials.



Applied Measurement Uncertainty for Testing Laboratories (EMU 201)

2 Days | LEUs: 1.4 |  |  | 

Target Learner: Testing Laboratory Managers, Engineers, Scientists, or Technicians

Description: During this course, the participant will be introduced to several tools and techniques that can be applied in the testing laboratory environment to efficiently and effectively create measurement uncertainty budgets which comply with ISO/IEC 17025 requirements. The tools presented are generic in nature such that they may be applied in a variety of testing laboratories.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Discuss the concepts within the Guide to the Expression of Uncertainty of Measurement (The GUM);
2. List and define the contributors for testing laboratory Type 'A' and Type 'B' measurement uncertainty distributions;
3. Determine how contributors are considered for inclusion in the uncertainty budget; and
4. Build a basic Test Measurement Uncertainty Budget.

Prerequisites:

1. Successful completion of A2LA WPT's Introduction to Measurement Uncertainty (EMU 101) course, OR have working knowledge of mathematics and statistics (such as root sum squares and statistical distributions);
2. Proficiency in spreadsheet use; and
3. Current employment in a testing laboratory with test methods requiring measurement uncertainty estimates.

Equipment/Materials: Participants should bring laptops with spreadsheet application, such as Excel.



Applied Measurement Uncertainty for Calibration Labs (EMU 202)

2 Days | CEUs: 1.4 |  |  | 

Target Learner: Calibration Laboratory Managers, Engineers, Scientists, or Technicians

Description: During this course, the participant will be introduced to several tools and techniques that can be applied in the calibration laboratory environment to efficiently and effectively create measurement uncertainty budgets which conform with ISO/IEC 17025 requirements. The tools presented are generic in nature such that they may be applied in a variety of calibration laboratories.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Discuss the concepts within the Guide to the Expression of Uncertainty of Measurement (The GUM);
2. List and define the contributors for calibration laboratory measurement uncertainty budgets;
3. Determine how contributors are considered for inclusion in the uncertainty budget; and
4. Build a basic Calibration Measurement Uncertainty Budget.

Prerequisites:

1. Successful completion of A2LA WPT's Introduction to Measurement Uncertainty (EMU 101) course, OR have working knowledge of mathematics and statistics (such as root sum squares and statistical distributions);
2. Proficiency in spreadsheet use; and
3. Current employment in the calibration/ metrology field.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.

Implementation of QA/QC Program & Risk Management Strategies Using Control Charts (EMU 250)

1 Day | LEUs: 0.7 |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: Participants will learn how to implement a robust control charting QA/QC program using risk-based thinking methods. This course presents different strategies for designing a control chart-based, QA/QC program to maintain method stability and cases for the selection of specific types of control charts to reduce the risk of not detecting a non-conformity in a test or measurement process. The course also includes methods to develop an out-of-control action plan (OCAP) to reduce risk of reporting bad data. In addition, the participant will learn to apply statistical methods for evaluating analytical measurement system performance in terms of precision and bias and explain tactics for periodic review of control chart parameters.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Define QA program parameters considering acceptable risk;
2. Select control chart and companion chart (I/MR, Xbar/R, Xbar/S, EWMA, CUSUM);
3. Collect and assess data;
4. Construct and interpret initial control charts;
5. Apply control chart to monitoring testing process; and
6. Develop out-of-control action plan.

Prerequisites: Basic Statistics for Laboratory Professionals (EMU 100) or equivalent knowledge.

Equipment/Materials: Participants should bring laptops with spreadsheet application, such as Excel.



Design of Experiments (DOE) for Method Validation & Laboratory Studies (EMU 320)

2 Days | **LEUs:** 1.4 |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This course covers the design of experiments (DOE) and analysis of laboratory-generated data. Laboratory applications of DOE include measurement system analysis (MSA), designed studies used in method validation and improvement, verification of competency, and evaluations of components of measurement uncertainty. The participant will learn the basic tools and potential pitfalls of experimental design and analysis of variance (ANOVA) by studying laboratory examples.

Learning Outcomes: After successful completion of this course, the participant will be able to:

1. Explain the difference between discrete and continuous variables, and dependent and independent variables;
2. Develop a DOE plan to meet specific objectives;
3. Describe and apply randomization and blocking;
4. Set up and interpret outcomes of measurement system analysis (MSA);
5. Interpret outputs of DOE analysis; and
6. Apply DOE to method validation, improvement and components of measurement uncertainty.

Prerequisites: Intermediate Statistics for Laboratory Professionals (EMU 200) or equivalent knowledge.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.

Introduction to Method Validation (EMU 400)

1 Day | **CEUs:** 0.7 |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: Participants will learn the history of method validation, understand conceptual differences in topics such as quality control/quality assurance, and method validation/method verification. In-depth discussions will focus on the elements that appropriately validate an analytical method with respect to method type and provide participants with a template for the method validation process.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Discuss the history of method validation from USP, FDA and GxP perspectives;
2. Describe the concepts and differences between quality control and quality assurance;
3. Define terms such as accuracy, precision, specificity, ruggedness and detection limits;
4. Given data, determine repeatability, reproducibility, and ruggedness;
5. Identify and describe the different method validations by type;
6. From memory, outline the required contents for documenting and validating a method; and
7. Using a validation template, choose a method type and perform a mock validation.

Prerequisites: Participants should be proficient in spreadsheet use and understand the requirements for method validation and verification of ISO/IEC 17025:2017.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Measurements, Risk & Products: Making Decisions on Conformance (EMU 401)

2 Days | LEUs: 1.4 |  |  | 

Target Learner: Directors, Managers, Engineers, Scientists, or Auditors

Description: This course covers measurement's influence throughout a product's lifecycle (design, manufacturing, testing, certification), where it fits within a management system (MS). Utilizing measurement data, the participant will be introduced to the technical and mathematical tools required to evaluate the probability of false accept and false reject decision risk for measurements used in conformity assessment decisions. The course will detail how this information can be used to balance the cost of managing the likelihood of occurrence against the cost of negative consequences resulting from an incorrect decision.

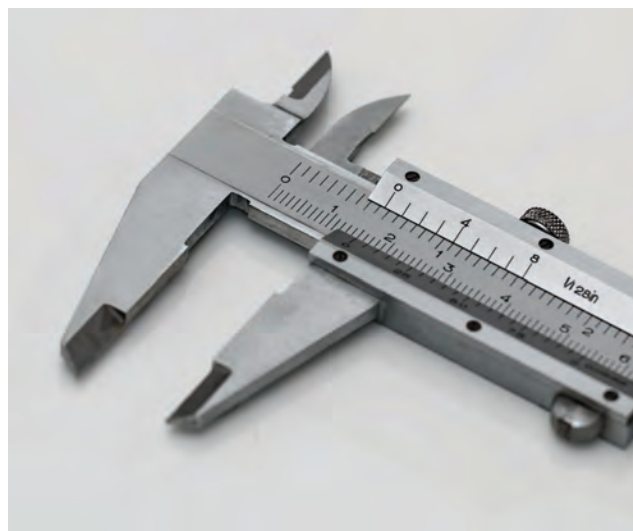
Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Identify the non-conformant element(s) in metrology-related failures and where it resides within the management system;
2. Recognize specific and global risk requirements in standards and how their differences might impact implementation costs;
3. List the four basic components of the General Risk Model (GRM) and how each influence the model;
4. Using a spreadsheet, develop a mathematical risk model to construct a decision rule; and
5. Develop a decision rule using techniques that balance the cost of metrology with the desired level of decision risk.

Prerequisites:

1. Familiarity with measurement principles and techniques;
2. Functional understanding of the principles of measurement uncertainty;
3. Training in engineering, science, or mathematics; and
4. Basic understanding of calculus, algebra, and statistics.

Equipment/Materials: Participants should bring laptops with a spreadsheet application, such as Excel.



Metrology

Metrology Applications for Engineers & Scientists

(MET 100-E)

10 Hours | LEUs: 1.0 |  |  |  |  | 

Target Learner: Laboratory Managers, Engineers, or Scientists

Description: This self-directed online course is designed to familiarize participants with metrology (the science of measurement) as it applies to their respective disciplines. A quantitative analysis of design based on metrology principles will help engineers and scientists to design better products and services and will facilitate clearer communication with professionals in other disciplines.

Key Topics:

- ▶ Measurement Parameters
- ▶ Statistics
- ▶ Measurement Uncertainty
- ▶ Applications

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.



Introduction to Measurement & Calibration (MET 101-E)

4 Hours | LEUs: 0.4 |  |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This self-directed online course is an overview of measurement and calibration principles, starting with the purpose of metrology and the concepts associated with accuracy, error, bias and measurement uncertainty. It progresses through the understanding of the hierarchy of measurement standards, managing metrology systems, applying principles to produce good measurements, and introducing key units of measure and measurement instruments.

Key Topics:

- ▶ Development and Concerns of Metrology
- ▶ Standards and Standardization
- ▶ Managing the Metrology System
- ▶ Making Good Measurements: Elements of a Measurement System
- ▶ Units and Measurement Instruments

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.

Safety in the Calibration Lab (MET 102-E)

4 Hours | LEUs: 0.4 |  |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This self-directed online course provides an understanding of potential hazards present in the calibration lab and how to mitigate risk by applying proper safety measures. Important topics include human risk factors, the proper safety measures associated with common disciplines and the proper use of personal protective equipment.

Key Topics:

- ▶ Fires
- ▶ Chemical
- ▶ Pressure
- ▶ Lasers
- ▶ Temperature
- ▶ Radiation

Prerequisites: None

Equipment/Materials: This e-learning course requires internet access to complete.

Precision Measurement Series-Level I

An easy-to-access, menu-driven curriculum allows the learner to concentrate on the topics specific to their job requirements. For anyone taking measurements, new hires, students or a refresher for more experienced technicians. All titles have their own parameter-specific glossary, pre- and post-tests and Certificate of Competency. The Level I courses introduce the participant to the terms, concepts, theory, principles of measurement, common units of measure, measurement error and uncertainty associated with a specific measurement discipline. It also describes the type of measuring equipment, applications and best practices. Maintenance of the equipment, metrological traceability and, where appropriate, general safety practices are also presented.

Precision Dimensional Measurement (DIM 101-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision dimensional measurement equipment as well as its usage and associated measurement principles:

- ▶ Gages/Gage Blocks
- ▶ Interferometers
- ▶ Optical Instruments



Precision Electrical Measurement (DCL 101-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision electrical measurement equipment as well as its usage and associated measurement principles:

- ▶ Analog Meters
- ▶ Digital Multi-Meters
- ▶ Faraday Shields



Precision Temperature Measurement (ENV 111-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision temperature measurement equipment as well as its usage and associated measurement principles:

- ▶ Thermocouples
- ▶ Resistance Temperature Detectors
- ▶ Thermistors
- ▶ Infrared Sensors

Precision Humidity Measurement (ENV 121-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision humidity measurement equipment as well as its usage and associated measurement principles:

- ▶ Hygrometers
- ▶ Chilled Mirror (CM) Hygrometers
- ▶ Wet and Dry Bulb Psychrometers

Precision Flow Measurement (FLU 101-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision flow measurement equipment as well as its usage and associated measurement principles:

- ▶ Ammeters
- ▶ Flowmeters
- ▶ Transducers
- ▶ Transmitters
- ▶ Turbine meters
- ▶ Vortex meters
- ▶ Electromagnetic meters
- ▶ Ultrasonic flowmeters
- ▶ Mass Flowmeters
- ▶ Coriolis meters

Precision Mass Measurement (MEC 111-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision mass measurement equipment as well as its usage and associated measurement principles:

- ▶ Weighing Instruments
- ▶ Reference Standards



Precision Force & Torque Measurement (MEC 121-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, or Scientists

Description: This Level I course covers the following precision force and torque measurement equipment as well as its usage and associated measurement principles:

- ▶ Transducers
- ▶ Load Cells
- ▶ Proving Rings
- ▶ Torque Testers

Precision Pressure & Vacuum Measurement (MEC 131-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians, Engineers, and Scientists

Description: This Level I course covers the following precision pressure and vacuum measurement equipment as well as its usage and associated measurement principles:

- ▶ Transducers
- ▶ Pressure Measurement Devices

Introduction to Pipettes (MEC 141-E)

6 Hours | LEUs: 0.6 |  |  |  | 

Target Learner: Technicians or Scientists

Description: This Level I course covers the following types of pipettes as well as their usage, applications, and associated measurement principles:

- ▶ Positive Air Displacement Pipettes
- ▶ Single Volume Pipettes
- ▶ Adjustable Pipettes
- ▶ Multichannel Pipettes

Precision Measurement Series-Level II

Certified Calibration Technician (CCT) Exam Prep (CCT 201-E)

20 Hours | LEUs: 2.0 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course was designed to prepare the learner for the CCT (Certified Calibration Technician) exam, and covers the primary topics represented in the exam. Subject matter includes general metrology, measurement systems, calibration systems, measurement uncertainty, and quality systems, all presented in the context of what will be most helpful in preparing for the CCT exam.

Key Topics:

- ▶ General Methodology
- ▶ Measurement and Calibration Systems
- ▶ Applied Mathematics, Statistics, and Measurement Uncertainty
- ▶ Quality Systems and Standards
- ▶ Uncertainty in the Workplace

What is OJT Mentor?

On-the-Job Training Mentor is a feature of our e-learning courses that quickly puts you in touch with an expert. If you have questions, need further clarification, or would like guidance on how to apply concepts effectively, you can access OJT Mentor from any e-learning module. OJT Mentor is available for the first 24 hours after starting any course, and can be utilized for up to 15 minutes at no charge.

For guidance requiring more than 15 minutes, please call us for Consulting Services.



Acoustics & Vibration Measurement (VIB 201-E)

10 Hours | LEUs: 1.0 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course will enable calibration technicians to precisely and reliably measure acoustics and vibration in accordance with relevant ISO standards. The material covers both conceptual and practical components of sound measurement, and the tools and units necessary to reliably measure acoustics and vibration.

Key Topics:

- ▶ Measurement Methods
- ▶ Measuring Instruments
- ▶ Quantifying Sound and Vibration
- ▶ Accelerometer Design and Calibration

Water Quality (CHE 201-E)

10 Hours | LEUs: 1.0 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: Participants in this self-directed online course will learn how to use the measurement of electrolytic conductivity to determine water quality. In this course, these principles will be primarily applied to water quality assessment for pharmaceutical, semiconductor and power plant industries, as well as to water intended for human consumption.

Key Topics:

- ▶ Introduction to pH
- ▶ pH Calibration Measurement Instruments
- ▶ Uncertainty of pH Measurement
- ▶ Power Measurements
- ▶ Influences on Conductivity Measurements

Geometric Dimensioning & Tolerancing (GD&T) (DIM 201-E)

10 Hours | LEUs: 1.0 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course is an overview of Geometric Dimensioning and Tolerancing (GD&T), a symbolic language used on engineering drawings, and is designed to give calibration technicians a general understanding of the history, applications, limitations, and use of GD&T. A2LA WPT's course is the only GD&T course available that is designed specifically around the unique responsibilities of the calibration technician or engineer.

Key Topics:

- ▶ GD&T Fundamental Elements
- ▶ Dimensioning Practices
- ▶ Datums and Modifiers
- ▶ Gage Certification
- ▶ Calibration Applications

Test Instruments Operation & Calibration (MET 201-E)

15 Hours | LEUs: 1.5 |  |  |  | 

Target Learner: Laboratory Managers, Engineers, Scientists, or Technicians

Description: This is a general overview of the principles and best practices associated with operating and calibrating test instruments. Topics covered include a wide range of the most common forms of measurement and their related measurement instruments (power, frequency, waveform, etc.) as well as how to use, maintain, store, and handle equipment to avoid damage, ensure accurate measurements, and support operator safety.

Key Topics:

- ▶ Basic Measurements
- ▶ Advanced Measurements
- ▶ Measurement Methods
- ▶ Common Test Equipment
- ▶ The Oscilloscope and Spectrum Analyzer

Prerequisite: None

Equipment/Materials: This e-learning course requires internet access to complete.



Dimensional Measurement: Roundness (DIM 202-E)

4 Hours | LEUs: 0.4 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: Participants in this self-directed online course will gain an advanced understanding of precision dimensional measurement relating to roundness. This course includes detailed information about the importance of roundness as a measurement, how and with what instruments roundness is measured, the fundamental geometry associated with roundness, and how to create and interpret relevant graphs.

Key Topics:

- ▶ Measurement Methods
- ▶ Measuring Instruments
- ▶ Causes
- ▶ Quantifying and Expressing

Dimensional Measurement: Hardness (DIM 203-E)

3 Hours | LEUs: 0.3 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: Participants in this self-directed online course will gain an advanced understanding of precision dimensional measurement relating to hardness. This includes detailed information on the types of hardness and the scales used to measure hardness, as well as practical methods and best practices for measuring, expressing, and converting or interpreting hardness.

Key Topics:

- ▶ Measurement Methods
- ▶ Measuring Instruments
- ▶ Causes
- ▶ Quantifying and Expressing

Dimensional Measurement: Surface Texture (DIM 204-E)

3 Hours | LEUs: 0.3 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: Participants in this self-directed online course will gain an advanced understanding of precision dimensional measurement relating to surface texture. This will include an overview of the nature of surfaces, wear, complexity, and other features related to the concept of surface texture, as well as methods used to measure and record surface texture, and how and when those methods apply to different surfaces.

Key Topics:

- ▶ Measurement Methods
- ▶ Measuring Instruments
- ▶ Causes
- ▶ Quantifying and Expressing

Coordinate Measuring Machine (CMM) (DIM 210-E)

10 Hours | LEUs: 1.0 |  |  |  | 

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course examines the basic concepts and principles of Coordinate Measuring Machines (CMMs), as defined by different manufacturers as well as the standard documents accepted by industry. Participants will gain an understanding of three-dimensional measurements in an X-Y-Z space and the relationship between various features such as lines, planes, distances, and profiles, which are required to work with CMMs.

Key Topics:

- ▶ Basic CMM Measurements
- ▶ Sampling Issues
- ▶ Probing Systems
- ▶ Basic CMM Accuracy and Specifications



AC/DC Metrology (DCL 201-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course is an overview of AC/DC metrology, with a specific focus on preparing the learner for the CCT (Certified Calibration Technician) exam. Contents include both conceptual and practical principles of AC/DC measurements, the tools and units of measure involved, the mathematical and physical principles at play, and how these apply to metrology.

Key Topics:

- ▶ Using AC/DC Transfer Standards
- ▶ Inductance and Capacitance
- ▶ Immittance and AC Ratio

Fiber Optics (OPT 201-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Engineers, Scientists, or Technicians

Description: In this self-directed online course, participants will learn the fundamentals of optical fiber and its uses, the scientific concepts related to the functionality of fiber optics, and the related technology used in conjunction with optical fiber based on its various applications.

Key Topics:

- ▶ Fiber Optic Measurement Techniques
- ▶ Optical Sources and Fiber Optic Transmitters
- ▶ Optical Detectors and Fiber Optic Receivers

Microwave Principles (MRF 201-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course provides an overview of microwave and radiofrequency microelectronics systems of all sizes and types, their applications, and the measurement and calibration principles associated with them. Participants will learn both the general principles of microwave frequencies and microwave technology, and the applied function of microwave antennas, devices, and other components.

Key Topics:

- ▶ Waveguide Theory and Application
- ▶ Microwave Components and Circuits
- ▶ Microwave Antennas

RF Measurement, Calibration & Connector Care (MRF 210-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online lesson describes principles and background information for the measurement of radio frequency electromagnetic fields. It also provides recommended measurement procedures.

This lesson is aimed at technicians working in the RF discipline and with the assumption that the user has a basic knowledge of electromagnetic field theory and practice.

Key Topics:

- ▶ Effective Use of Different Connectors
- ▶ Inspecting and Maintaining Connectors
- ▶ Industry Standard Specifications

Time & Frequency Measurement (TFR 201-E)

10 Hours | LEUs: 1.0 | | | |

Target Learner: Engineers, Scientists, or Technicians

Description: This self-directed online course is an overview of the basic concepts of time and frequency measurement, as they apply to a wide range of disciplines. Materials will cover topics such as measurement time scales and how they are used, the principles of frequency, and the various tools and equipment used to measure and record frequency.

Key Topics:

- ▶ Digital Clock Accuracy and Synchronization
- ▶ Sources of Error
- ▶ Stability
- ▶ Transfer Standards Performance

Soft Skills Courses



Effective Training Strategies

(TRN 101)

1 Day | CEUs: 0.7 |  | 

Target Learner: Trainers or Laboratory Managers

Description: This course provides guidance for designing and implementing training that is effective for adult learners. This course demonstrates the use of several training tools and techniques such as Blooms Taxonomy, Kirkpatrick, SAM and ADDIE, etc., that a manager or trainer might apply with their audience.

Learning Outcomes: After successful completion of the course, the participant will be able to:

1. Evaluate whether formal training is needed;
2. Write effective learning objectives;
3. Identify appropriate training goals to meet defined objectives;
4. Devise a process for staff accountability of training to a supervisor;
5. Plan an environment conducive for learning;
6. Create suitable learning activities; and
7. Identify learning assessment techniques.

Prerequisites: None

Equipment/Materials: Participants may bring an existing training presentation for use during the course.



Consulting and Coaching

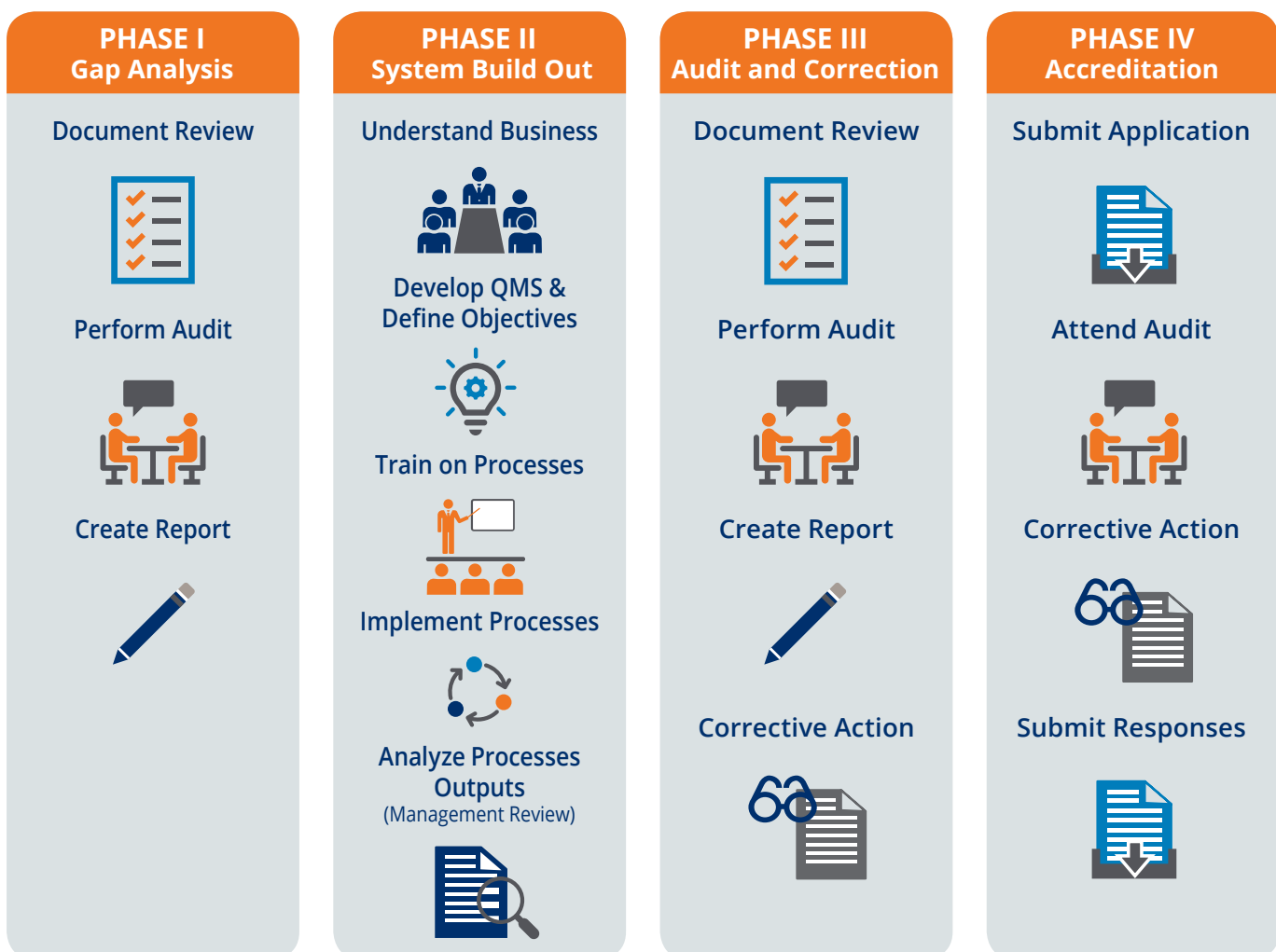
Guided Instruction

Training courses are excellent foundations for individuals. Is there an equivalent solution for organizations trying to establish or change the direction of its business? Absolutely!

Our goal is to provide world-recognized coaches from multiple industry sectors and measurement specialties to equip organizations to meet new market demands, change organizational dynamics, hone operational efficiencies, and minimize internal biases and management blind spots. The key to any consulting and coaching success is one thing: trusting relationships. Before we open a file or put one keystroke to a document, A2LA WPT takes the time to learn about your organization's personality and the factors that shape it. We interface with the appropriate levels within the company to identify:

- ▶ The stakeholders that drive and shape your business direction and product
- ▶ Culture, mission, and key objectives
- ▶ Strengths & weaknesses of the organization, and
- ▶ Policies and processes.

We employ a four-phase approach to consulting on management systems after we assess the attributes, above:



For start-ups with limited resources, we have solutions for you as well.

A2LAWPT.org/consult

Meet Your A2LA WPT Instructors



Bibi Abdullah



Johanna Acuna



Dr. Susan Audino



Dr. Kelly Black



Roger Brauninger



Beth Carbonella



Linda Crawford



Jenna Freeman



David Fricker



Chris Gunning



Paul Keep



Rob Knake



Carlyn Mathews



Soraya McClung



Dawn Mettler



Scott Mimbs



Tim Osborne



Heidi Phillips



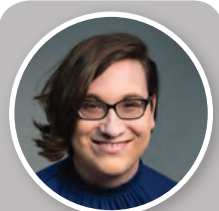
Scott Poore



Werner Schaefer



Ashley Schafer



Jenna Schoettker



Marcela Shkolnik



Dr. Dilip Shah



Nick Slawson



Dan Tholen



Lorena Villarreal



Jane Weitzel



Pam Wright

Interested in Hosting or Sponsoring a Training Event?

The learning environment has a powerful impact on adult learning. At A2LA WorkPlace Training, we have received many positive testimonies that illustrate how surroundings impact a participant's abilities to engage and retain knowledge. A2LA WPT believes that creating an environment which inspires and promotes collaboration and focus enhances the participants' experience. We have designed our modern training spaces to ensure we achieve this goal by removing distracting aesthetics or unpleasant environmental conditions.

At the same time, we also realize that travel to a training event can be expensive. To meet the needs of your organization, we would like to partner with you to host or sponsor a training event in your area as a cost effective solution. It's a win-win!

Hosting a Public Training Event

Do you have a showcase facility that can accommodate eight or more people for training? Let's talk! You save money by eliminating travel costs and you gain potential revenue by increasing your branding footprint through co-marketing through our contact lists. Depending on the number of paid attendees, you might earn discounts on participating employees.

Sponsoring Snacks and Lunches

Even if you don't have a facility conducive for training, you might decide you would like to increase brand recognition. You may choose to sponsor a meal or snacks for a training event. Similar to a hosted-event, we will recognize your generosity through co-branded email blasts and social media postings.

A2LAWPT.org/host
240-422-8270



Visit our website for the most up-to-date calendar of publicly available training courses, including location information and registration links.

A2LAWPT.org/catalog

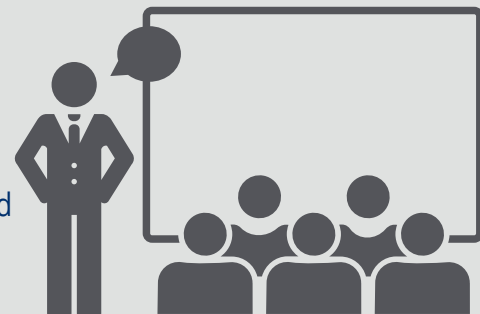
Or scan the QR code to take you directly there!



Looking for a Customized Training Solution?

Consider Contract Training.

If your organization is considering staff training but requires specially designed courses or different dates and locations, A2LA WPT can customize the training to fulfill your objectives. Host at your own facility or at a suitable location of your choosing, and any number of your staff can participate in A2LA WPT courses led by our highly trained instructors.

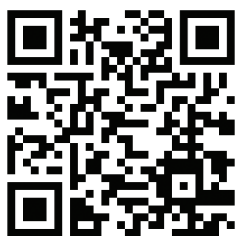


We are eager to help you get the most out of contract training. For additional information or to request a customized quote, visit www.A2LAWPT.org/customize or call **240-422-8270**.



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Frederick, MD 21703

*“The best leader
- a servant;
the best teacher
- a student.”*



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