COURSE CATALOG

eQuaLearn°



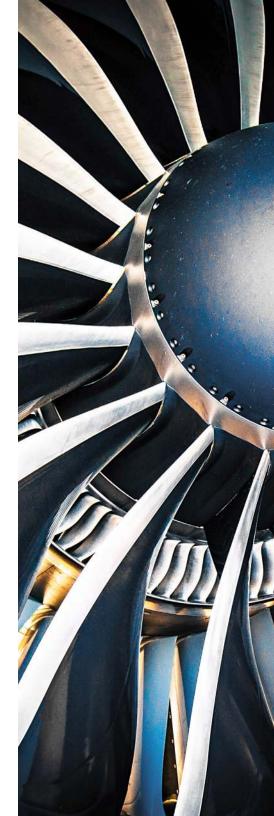
eQuaLearn

About eQuaLearn

eQuaLearn offers professional development programs and managed learning resources to improve the quality of personnel, products and processes through public and onsite courses and memberships.

eQuaLearn is managed by the not-for-profit Performance Review Institute (PRI), which also administers the Nadcap audit and accreditation program for the global aerospace industry.

The eQuaLearn program was launched in 2008, with subscribing organizations within Nadcap endorsing the training courses. While PRI offered limited professional development courses prior to 2008, the establishment of eQuaLearn has led to the development of a greater number of courses in more diverse technical specializations. Many courses have been translated into multiple languages to meet customer need.



eQuaLearn

Training Options

Instructor Led Training

Public Session: Recommended for companies with a small number of individuals requiring training. Training is conducted by subject matter experts who come to the classroom with content expertise, industry experience, and on-the-job knowhow. This also affords attendees the opportunity to network with peers from key industry players from around the world.

Onsite Training: Recommended for companies with multiple individuals requiring training.
Customized training is scheduled for an eQuaLearn instructor to conduct one or more of the courses detailed in this catalog at your facility or facilities. It is a truly flexible option that allows you the opportunity to:

- Schedule courses at your convenience
- Reduce costs save money on travel expense and reduce time out of the office
- Customize content to ensure programs are job related and that new skills are immediately usable

Hosted Training: Recommended for companies with a small number of individuals who require training when a public session is not convenient. Companies are offered the option of hosting the training session at their company facility with enrollment open to other companies. eQuaLearn markets and manages outside registrations and coordination of all details. The host company receives a limited number of free enrollments and reduced training fees.

Webinar Training

Recommended for companies who wish to provide training while limiting time out of the office. Delivered using interactive web technology, these live training sessions can be viewed from your desk. Convenient, eQuaLearn webinars save you the expense of travel and time away from the workplace by delivering training online. Companies also have the option of private virtual sessions as well.

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INTRODUCTION TO PYROMETRY (AMS 2750E)

Two days | \$999 | Instructor Led Training

A comprehensive discussion of the SAE AMS 2750E specification and how to apply the requirements at your company.

Course Summary:

- Pyrometry & AMS 2750E
- Temperature Sensors
- Instrumentation
- Classification of Furnaces
- System Accuracy Tests

Course Objectives:

- Assure a thorough understanding of pyrometric controls applicable to heat treating
- Discuss the application of pyrometric controls within the typical heat treat facility
- Clarify the intent and interpretation of SAE AMS 2750E

NOTE: It is recommended that participants bring a copy of the AMS 2750 Rev E to class for reference.

PYROMETRY ESSENTIALS (AMS 2750E)

One day | \$550 | Instructor Led Training

This course identifies the essential features of any Pyrometry system in Aerospace, but does not substitute for the detailed training given in the 'Introduction to Pyrometry' course.

Course Summary:

- How to classify furnaces, in order to apply the pyrometry rules
- The role of sensors, especially thermocouples. The hierarchy of use and the rules and limitations on use
- The roles of the different kinds of instruments. The hierarchy of use, the accuracy required and the requirements for calibration
- The Systems Accuracy Test, what it is plus when and how to do it. Calculating SAT results. The alternatives to SAT
- The Temperature Uniformity Survey, when and how to do it, the temperatures required, how to evaluate the results
- For all the above, the minimum reporting requirements are also described, as well as the typical errors and problems found during Nadcap audits

- To ensure an understanding of the requirements for pyrometric controls on aerospace furnaces used for heat treatment.
- To ensure an awareness of the contents of AMS 2750 and the interpretations of the Nadcap Heat Treatment Task Group.

HEAT TREATMENT

eQuaLearn Heat Treatment training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce. This course is available in three levels:

PROCESS OPERATOR Two days | \$900 | Instructor Led Training

The Process Operator understands and performs the basic hands-on operations of the special process.

Course Summary:

- Definitions of industry terms and Metals
- Transformations during heating
- Transformations during cooling
- Sub-zero treatments cryogenic or refrigeration
- Ferrous alloys used in aerospace
- · Corrosion resistant steels
- Coatings, Diffusion Coatings Carburizing and Nitriding
- Heat Treatments & Final Heat Treatments
- Carburizing & Brazing
- Equipment capability to perform high quality heat treatment
- · Load preparation and furnace loading
- Cleaning and cleanliness
- · Spacing of parts & thermocouples
- · Loading hot versus loading cold
- · Heat-up rates & Quenching
- Un-loading, Cycle review, Quality provisions & Storage

Course Objectives:

- Provide basic knowledge of metallurgical aspects at heat treat, coating and brazing of metallic materials.
- Facilitate the understanding of thermal processes and their effects on the final product properties.
- Provide a metallurgical approach for better understanding of importance to work to written instructions.
- Improve the general heat treat operator work performance, process efficiency and final product quality.

PROCESS PLANNER

Three days | \$1,250 | Instructor Led Training

Process Planners are capable of selecting manufacturing processes and interpreting process procedures to conform to customer specifications and requirements. Process Planners are capable of problem solving and resolving day-to-day issues.

- Basic Metallurgy
- Alloy Types and Issues
- Special Treatments
- Hardware
- Paperwork

HEAT TREATMENT (CONTINUED)

Course Objectives:

- Basic Pyrometry TUS/SAT (AMS 2750)
- Specification interpretation
- · Testing and inspection
- Raising shop floor paperwork
- · Problem solving and error proofing
- · Health and safety

PROCESS OWNER Two days | \$900 | Instructor Led Training

Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Capital Owners are capable of designing new processes and resolving issues among all other levels.

Course Summary:

- Interpretation of specifications
- · Hierarchy and flowdown information
- Procedures and inspection
- · Operator approvals
- Heat Treatments & Final Heat Treatments
- · Carburizing & Brazing
- Equipment capability to perform high quality heat treatment
- Load preparation and furnace loading
- · Cleaning and cleanliness
- Spacing of Parts & Thermocouples
- · Loading hot versus loading cold
- Heat-up rates & Quenchin
- Un-loading, Cycle review, Quality provisions & Storage

Course Objectives:

To ensure an understanding of:

- Relevant specification interpretation.
- Review and approval process definitions.
- Part specific heat treat instructions.
- · Review and approval procedures.
- Qualification of Operators and Planners.
- How to resolve and avoid common problems in Heat Treatment.

BASIC METALLURGY OF HEAT TREATING

3 hours | \$200 | Webinar

The Basic Metallurgy course may be a tool kit to help employees identify in process changes, which might be detrimental to customers product and taking appropriate corrective action to reduce the risk of nonconformity. Which they may not have had sufficient understanding to do previously.

Course Summary:

- Introduction-What is Heat Treatment
- Metals and Structures
- Deformation
- Alloying
- Properties & Testing

BASIC HEAT TREATMENT

3 hours | \$200 | Webinar

The Basic Heat Treatment Course introduces some of the fundamental issues related to Heat Treatment Processes carried out on a wide range of metals and alloys. Many of the controlling factors are common to a variety of materials. It also provides an explanation of how heat is transferred from furnace to load, the various types of furnaces and processes, and an introduction to Pyrometry.

- A brief history
- What is heat treatment
- Why heat treat anyway
- Heat Transfer (Heating and cooling)
- Furnace types, Processes and Atmospheres
- Overview of furnace controls (Pyrometry)

HEAT TREATMENT OF ALLOY STEELS

2 hours | \$200 | Webinar

The Heat Treatment of Alloy Steels webinar brings together theory and practice. This webinar relates basic metallurgy to what happens during the heat treatment of steels. The different treatments applied to alloy steels are also described

Course Summary:

- Iron and Steel what is the difference?
- · Alloy Steels Basics
- · Common Alloys
- Treatments
- Introduction and use of CCT and TTT diagrams
- Special Considerations (including Nadcap)
- Soak Time including start and end of Soak
- Quenching
- Effect of process deviation on structure
- Distortion and cracking

HEAT TREATMENT OF STAINLESS STEELS

2 hours | \$200 | Webinar

This webinar covers the heat treatments of the four categories of Stainless Steel - Austenitic, Ferritic, Martensitic and Precipitation Hardening (PH). This course relates to basic metallurgy and the knowledge of steels to explain the various treatments made on stainless and precipitation hardening steels.

- Stainless Steels Basics
- Common Alloys
- Treatments
- Special Considerations (including Nadcap)
- Effect of process deviation on structure and properties
- Distortion, cracking and other issues



HEAT TREATMENT OF DIFFUSION PROCESSES

2 hours | \$200 | Webinar

The four main types of surface treatment are discussed (Carburizing, Carbo-nitriding, Nitriding and Ferritic Nitrocarburizing) with emphasis on the practical aspects of Heat Treatment. An opening section describing how Diffusion works and an end section on determination of case hardened depth completes the package.

Course Summary:

- What is Diffusion an explanation
- Why and how does it happen and why is it important?
- Carburizing
- Atmospheres and control
- Typical process models
- · Carbo-Nitriding
- Nitridina
- Process types
- Start of soak (all processes)
- Nitrocarburizing (Ferritic)
- · Determination of Case depth
- Difference between Total and Effective Case

HEAT TREATMENT OF ALUMINUM ALLOYS

2 hours | \$200 | Webinar

A short but detailed presentation which gives the fundamental background to the heat treatment of Aluminum. It includes a brief commentary on issues including the effects of solution treatment, precipitation and ageing. The presentation also related some of the challenges surrounding the heat treatment of this widely used family of alloys within the aerospace industry.

- Introduction to Aluminum
- Alloy Types and treatments
- Limitations to use and in particular heat treatment temperatures
- · Solution treatments
- Quenching
- · Precipitation and Ageing
- Controlling Natural Ageing
- Radiative heating and the risk of incipient melting
- Degradation due to Hydrogen Absorption
- Corrosion
- Evaluation Tensile, Hardness and Conductivity tests

HEAT TREATMENT OF TITANIUM ALLOYS

2 hours | \$200 | Webinar

This presentation gives the fundamental background to the Heat Treatment of Titanium. It includes a brief commentary on issues including the effects of solution treatment, precipitation and ageing.

Course Summary:

- Introduction to Titanium and its Alloys
- Alloy Types and treatments
- Alpha / Beta Alloys and Beta Transus
- · Solution treatments
- Quenching
- · Precipitation and Ageing
- Precautions during cleaning and handling of Titanium parts and material
- Degradation due to Hydrogen Absorption (and recovery)
- Alpha Case and what to do about it



"I was very impressed with the course. I would like all of my employees to take this course. I think anyone involved with Heat Treat would benefit."

Heat Treat Production Manager Spirt AeroSystems

HEAT TREATMENT OF NICKEL BASED ALLOYS

2 hours | \$200 | Webinar

The fundamental background to the Heat Treatment of Nickel and Cobalt based alloys often referred to as 'Super Alloys" is covered in this training. These are resistant to elevated temperatures and are often used as 'Hot End' products in the back half of a jet engine or a turbine.

This session includes a brief commentary on Alloy types, Heat treatments, properties and a short introduction to the implications for single Crystal Castings.

Course Summary:

- Introduction to Nickel Based Alloys
- Alloy types and response to Heat treatment
- Heat Treatment processes add:
 - Stress relieving
 - Annealing
 - Stabilisation
 - Solution
 - Precipitation
 - The influence of ý (Gamma Prime)
 - An introduction to Single Crystal Castings

HEAT TREATMENT IN BRAZING

2 hours | \$200 | Webinar

This session describes the furnace brazing in Aerospace, covering atmosphere, vacuum and salt bath brazing. Torch and Induction brazing are also briefly described. It covers the use of furnaces to make brazed joints, highlighting the key differences between brazing and other heat treatment processes. The underlying science is introduced.

- Why and how does it happen and why is it important?
- Types of braze process
- Process and Pitfalls
- Typical process models
- Key controlling factors
- Process types
- · Start of soak and Potential Conflicts
- · Key issues which affect success

HEAT TREATMENT CONTROL & INSPECTION

3 hours | \$200 | Webinar

This webinar provides a summary of the controls and checks expected during aerospace heat treatment, including batch and periodic tests. with particular reference to Aluminum alloys. The context of these controls is explained through the introduction and clarification of the underlying metallurgy and the important parameters affecting heat treatment, including such things as alloying, phases, types of heat transfer. deformation and contamination. The controls required, for both processes and parts, are introduced and described. These include essential pyrometry, tensile, hardness conductivity and metallographic tests.

- · Basic Metallurgy of Heat Treatment
- Basic Heat Treatments
- Process Controls
- Process (Cycle) Verification
- Part / Material Inspection Methods
- Batch Inspections
- Periodic Inspections
- Quench Systems
- Atmosphere Controls

NADCAP AUDIT PREPARATION COURSES

NADCAP AUDIT PREPARATION

Two days / Three days | \$750 / \$800 | Instructor Led Training

These courses are designed to provide complete overview of Nadcap requirements related to specific technical areas. The courses will always address the current version of the Audit Criteria. Where revisions have been confirmed but not yet implemented, the instructor will describe and clarify any significant changes. An important aspect to these courses is the opportunity to ask questions at any time and on any subject related to the Nadcap accreditation process.

Nadcap Audit Preparation Courses are available for the following:

- Chemical Processing 2 days
- Coatings 2 days
- Composites 2 days
- Electronics 2 days
- Heat Treating 2 days
- Measurement & Inspection 2 days
- Metallic Materials Testing 2 days
- Non-Destructive Testing 3 days
- Surface Enhancement 2 days
- Welding 3 days

Course Summary:

- Nadcap and the Task Group
- · Preparing for an audit
- · During an audit
- · After an audit
- Review of the baseline and supplemental Audit Criteria
- Common non-conformances

- Clarify the roles of Nadcap, PRI and Nadcap audits in the management and oversight of Special Processes in the Aerospace industry.
- Present the structure and format of a Nadcap audit, including the pre- and post- audit process and expectations.
- Assure an understanding of the content and intent of all sections of each Audit Criteria used during an audit.
- Review the common nonconformances and provide examples of how to meet requirements.

NADCAP AUDIT PREPARATION COURSES

NADCAP AUDIT CRITERIA REVIEW

One day / Two days I \$550 / \$750 | Instructor Led Training

These courses focus on the Audit Criteria and common non-conformances. This option is ideal for individuals who have a good understanding of the Nadcap program and the audit process.

Nadcap Audit Criteria Review Courses are available for the following:

- Chemical Processing 1 day
- Coatings 1 day
- Composites 1 day
- Electronics 1 day
- Heat Treating 1 day
- Measurement & Inspection 1 day
- Metallic Materials Testing 1 day
- Non-Destructive Testing 2 days
- Surface Enhancement 1 day
- Welding 2 days

Course Summary:

- During an Audit
- Review of baseline and supplemental Audit Criteria
- · Preparation for an Audit
- Common Non-conformances

Course Objectives:

- Present the structure and format of a Nadcap audit.
- Assure an understanding of the content and intent of all sections of each Audit Criteria used during an audit.

NADCAP AUDIT PREPARATION

3 hours | \$200 | Webinar

A webinar designed to provide an overview for companies that need to understand how to prepare for a Nadcap special process audit, and learn the detailed requirements of each Nadcap Task Group.

- Nadcap and Your Task Group
- The Audit
- Audit Structure
- Audit Criteria
- Non-Conformances
- Before the Audit
- After the Audit

NADCAP AUDIT PREPARATION COURSES



"Highly recommend to anyone working in quality within aerospace."

Quality/Calibration Technician LISI Aerospace

INTRODUCTION TO PRI/NADCAP

3 hours | Complimentary | Webinar

eQuaLearn's Introduction to PRI/ Nadcap is a free training webinar that was developed to assist suppliers preparation efforts for initial Nadcap audits. The training is conducted by PRI Staff. PRI believes the information provided during these sessions and the interaction between companies will aid you in your goal of achieving Nadcap Accreditation.

Introduction to PRI/Nadcap is targeted for Suppliers who have scheduled a new audit, an audit in a new special process/product, or for companies who have new Nadcap contacts.

- Valuable information on the Nadcap system
- Expectations for audit readiness
- · Close-out of corrective actions
- Tools available to assist you in your preparation efforts

THE SCIENCE AND APPLICATION OF PLATING

Two days | \$800 | Instructor Led Training

This is the ideal course for all personnel connected to plating planning, results, controls, oversight, troubleshooting and hands-on application. Understanding the process, applying correct data collection, and maintenance can result in zero defects.

Course Summary:

- Introduction / Overview of Plating Chemistry
- Introduction and Comprehension of:
 - The Consequences of Incorrect Processing
 - Successful Operation from Written Documentation
 - Improving Process Operator Performance
 - Various Plating Techniques and Processes
 - Pre-Treatment, Post-Treatment
 - Systems Adjustments for Various Requirements
 - Proper Internal Instructions
- · Racking & Masking
- · Extensive Overview of:
 - Need and Application of Proper Cleaning
 - Importance of Process-Operator Observation
 - Various Rinsing Systems and Results
 - Proper Water Break Free Procedure/Execution
 - Application of Subjective Analytical Systems to Successfully Diagnose and Correct Processes

- To help attendees understand the science and application of chemical processes used to modify and enhance surface properties and performance.
- To provide knowledge of the plating process and the importance of the relationships in all steps of the plating process.
- To facilitate the understanding of pretreatment and post-treatment steps in the process.
- To ensure an understanding of lot and periodic test and the significance of sampling plans.
- To provide a chemical approach for better understanding of importance of written instructions and procedures.
- To illustrate the value of records and their review in yielding zero reject targets.
- To give all responsible parties the tools to totally understand the processes to a "zero defect" end.

THE SCIENCE OF ENGINEERING AND ANODIZING

Two days | \$800 | Instructor Led Training

This course is designed to provide an understanding of the science and engineering of chemical process used to modify and enhance surface properties and performance.

Course Summary:

- Basic Knowledge of Anodizing and Their Specifications
- Review of the Periodic Table Role of Planning & Contract Review
- Tooling/Racking & Masking
- Pre-treatment
- Conversion Coating
- Chromic Acid Anodizing
- Sulfuric Acid Anodizing
- Hard Anodizing
- Stripping
- · Acceptance and Periodic Testing
- Solution Control

- To provide knowledge of the anodizing process and the important differences between chromating, anodizing and plating, with particular reference to the importance of the alloy (metal) and the process solutions and chemistry involved.
- To facilitate the understanding of preparation, processing and stripping of chromating and various types of anodizing and their effects on the final product properties.

- To ensure an understanding of key lot and periodic tests and their significance.
- To provide a chemical approach for better understanding of importance of written instructions and procedures.
- To illustrate the value of records and their review.

ANODIZING

eQuaLearn Chemical Processing training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce. This course is available in three levels:

PROCESS OPERATOR Two days | \$900 | Instructor Led Training

The Process Operator understands and performs the basic hands-on operations of the special process.

Course Summary:

- · Introduction to Chemical Processing
- Anodizing Overview
- Basics of Aluminum Alloys & Documentation
- Preparation for Chemical Processing
- Aluminum Pre-Treatment
- Conversion Coating Chromating
- Chromic Acid Anodizing
- Anodized Aluminum Post Treatments & Inspection
- Overview of Process Control

Course Objectives:

- To provide basic knowledge of the necessity for chemical processes and the range available.
- To understand the ability of chemical processes to modify / enhance.
 surface properties and performance
- To provide basic knowledge of the anodizing process and the important differences between anodizing and plating.

- To facilitate the understanding of different anodizing and related processes, such as chromating and the consequences of incorrect processing.
- To provide a chemical approach for better understanding of importance to work to written instructions with particular reference to pre-treatment, rinsing, anodizing conditions and post treatments.

PROCESS PLANNER

Two days | \$900 | Instructor Led Training

The Process Planners are capable of selecting manufacturing processes and interpreting process procedures to conform to customer specifications and requirements. Process Planners are capable of problem solving and resolving day-to-day issues.

- · Definition of industry terms
- Review of Terminology and Anodic Film Formation and Structure
- Role Planning & Contract Review
- Tooling/Jigging and Masking
- Aluminum Pre-Treatment & Chromating
- Chromic Acid Anodizing, Sulfuric Acid Anodizing & Hard Anodizing-Program Choices
- Stripping
- Inspection Lot & Periodic Testing
- Process Solution Control (Analysis) Procedures

Course Objectives:

- To understand the ability of chemical processes to modify / enhance surface properties and performance
- To provide further knowledge of the anodizing process and the important differences between chromating, anodizing and plating with particular reference to the importance of the alloy (metal) and the process solutions involved in the context of Planning and Contract Review
- To facilitate the understanding of preparation, processing and stripping of chromating and various types of anodizing and their effects on the final product properties
- To provide a chemical approach for better understanding of importance of written instructions and procedures

- Health & Safety, Environmental & Risk Assessment
- Problem Solving Solutions

Course Objectives:

- Improve interpretation of Chemical Processing specification.
- Understand Reviewing and Approving Processes.
- Ensure that the Operators and Planners are qualified.
- Sources and Solutions to Problems.

PROCESS OWNER

One day | \$550 | Instructor Led Training

The Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Owners are capable of designing new processes and resolving issues among all other levels.

- Introduction
- Overview of Anodizing
- General Considerations for Processing New Work Requirements for Plant & Process Sequences & Specification Compliance
- Qualification and Approval of Operators & Planners

COATINGS: ACHIEVING MERIT

3 hours | \$200 | Webinar

The webinar has been designed to help Nadcap Coating suppliers achieve merit. The Coatings Task Group is committed to offering a review of the merit criteria along with a look into ideas and strategies for achieving merit.

Course Summary:

- Merit Overview
 - Definition
 - Benefits
 - · Accreditation Length
 - Timeline
- 18 Month Merit Criteria
 - · Summary of the criteria
 - Detailed look at each criteria with explanations, common pitfalls and strategies
- 24 Month Merit Criteria
 - Summary of the criteria
 - Detailed look at each criteria with explanations, common pitfalls and strategies



"I thoroughly enjoyed the course and believe this knowledge will be incredibly useful to me in the future."

> Precision Inspector RBC Bearings

FUSION WELDING (TIG/GTAW)

eQuaLearn Welding training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce. This course is available in three levels:

PROCESS OPERATOR

Two days | \$900 | Instructor Led Training

The Process Operator understands and performs the basic hands-on operations of the special process.

Course Summary:

- · Quality Systems & Basic Principles
- Welder Qualification
- Drawing Symbols
- Acceptance Criteria
- Process Control & Compliance
- Metallurgy

Course Objectives:

- Understand the main requirements for the manufacture of parts which utilizes Fusion GTA Welding – Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements.
- Understand how fusion welding works and how it is affected by its environment.
- Understand the associated control requirements.
- Clarify the intent and interpretation of controlling specifications.

PROCESS PLANNER

Two days | \$900 | Instructor Led Training

The Process Planners are capable of selecting manufacturing processes and interpreting process procedures to conform to customer specifications and requirements. Process Planners are capable of problem solving and resolving day-to-day issues.

Course Summary:

- Quality Systems & Basic Principles
- Welder Qualification
- Contract Review
- · Drawing Symbols
- · Acceptance Criteria
- Process Control & Compliance
- Metallurgy
- NDT
- · Other Weld

- Understand the main requirements for the manufacture of parts which utilize Fusion GTA Welding – Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements.
- Understand how fusion welding works and how it is affected by its environment.
- Understand the associated control requirements.
- Clarify the intent and interpretation of controlling specifications.

FUSION WELDING (TIG/GTAW) (CONTINUED)

PROCESS OWNER

Three days | \$1,250 | Instructor Led Training

The Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Owners are capable of designing new processes and resolving issues among all other levels.

Course Summary:

- · Quality Systems & Basic Principles
- Welder Qualification
- Contract Review
- Drawing Symbols
- Acceptance Criteria
- Process Control & Compliance
- Metallurgy
- Nickel/Aluminum/Magnesium/ Titanium Alloys
- Steels
- NDT
- Equipment & Robotics
- Other Weld Processes

- Understand the main requirements for the manufacture of parts which utilizes Fusion GTA Welding – Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements
- Understand how fusion welding works and how it is affected by its environment.

- Understand the associated control requirements.
- Clarify the intent and interpretation of controlling specifications.

RESISTANCE WELDING

eQuaLearn Welding training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce. This course is available in three levels:

PROCESS OPERATOR

Two days | \$900 | Instructor Led Training

The Process Operator understands and performs the basic hands-on operations of the special process.

Course Summary:

- · Quality Systems & Basic Principles
- Weld Operator / Machine Qualification
- Drawing Symbols
- Acceptance Criteria
- Process Control & Compliance
- Troubleshooting

Course Objectives:

- Understand the main requirements for the manufacture of parts which utilizes Resistance Welding -Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements.
- To underpin the knowledge for Resistance Welding.
- Understand how Resistance Welding works and how it is affected by its environment – work station.
- Understand the associated control requirements.

Clarify the intent and interpretation of controlling specifications

PROCESS PLANNER

Two days | \$900 | Instructor Led Training

The Process Planners are capable of selecting manufacturing processes and interpreting process procedures to conform to customer specifications and requirements. Process Planners are capable of problem solving and resolving day-to-day issues.

Course Summary:

- Quality Systems & Basic Principles
- Quality Systems & Basic Principles
- Weld Operator / Machine Qualification
- Contract Review
- Acceptance Criteria
- Drawing Symbols
- Process Control & Compliance
- Metallurgy
- NDT

- Understand the main requirements for the manufacture of parts which utilizes Resistance Welding - Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements.
- To underpin the knowledge for Resistance Welding.
- Understand how Resistance Welding works and how it is affected by its environment – work station.
- Understand the associated control requirements.

RESISTANCE WELDING (CONTINUED)

 Clarify the intent and interpretation of controlling specifications.

PROCESS OWNER

Three days | \$1,250 | Instructor Led Training

The Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Owners are capable of designing new processes and resolving issues among all other levels.

Course Summary:

- Quality Systems & Basic Principles
- Weld Operator / Machine Qualification
- Contract Review
- · Drawing Symbols
- Acceptance Criteria
- Process Control & Compliance
- Metallurgy
- Nickel/Aluminium/Magnesium/ Titanium Alloys
- Steels
- NDT
- Equipments & Robotics
- Other Weld Processes
- Troubleshooting

- Understand the main requirements for the manufacture of parts which utilizes Resistance Welding - Compliance.
- Compliance to approved documentation.
- Compliance to customer requirements.
- To underpin the knowledge for Resistance Welding.
- Understand how Resistance Welding works and how it is affected by its environment – work station.
- Understand the associated control requirements.
- Clarify the intent and interpretation of controlling specifications.

MAGNETIC PARTICLE

eQuaLearn Non-Destructive Testing Training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce.

PROCESS OWNER (LEVEL 3) Two days | \$900 | Instructor Led Training

The Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Owners are capable of designing new processes and resolving issues among all other levels.

Course Summary:

- The Role of the Level 3
- NDT Control
- Qualification and Certification of NDT Personnel
- Control of Documentation
- Calibration and Process Control
- Introduction
- Identification of Customer Requirements
- · Liaison with other functions
- Product Awareness
- Written Instructions
- Magnetic Particle Inspection Systems
- Formulae
- Process Control

- Provide knowledge to interpret codes, standards, and other contractual documents that control the NDT method(s).
- Understand the technical responsibilities of a Level 3 for NDT facility and personnel.
- Ability to select a method and technique for a specific inspection.
- Ability to create, verify and approve the technical adequacy of procedures and work instructions for NDT related documents.
- Knowledge for conducting performance reviews of NDT personnel and NDT technical audits.

PENETRANT

eQuaLearn Non-Destructive Testing training provides the students with the information necessary to improve their skills and competencies in the aerospace workforce.

PROCESS OWNER (LEVEL 3) Two Days | \$900 | Instructor Led Training

The Process Owners are capable of writing, reviewing and approving processes, procedures and qualifications of lower levels. Process Owners are capable of designing new processes and resolving issues among all other levels.

Course Summary:

- The Role of the Level 3
- NDT Control
- Qualification and Certification of NDT Personnel
- · Control of Documentation
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- Introduction
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- · Liaison with other functions
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- Ability to create, verify and approve the technical adequacy of procedures and work instructions for NDT related documents.
- Knowledge for conducting performance reviews of NDT personnel and NDT technical audits.

NDT LEVEL III RESPONSIBILITIES

One day | \$550 | Instructor Led Training

This course is designed to provide insight into the activities assigned to a Level III per industry standards, as well as Nadcap. It also includes a review of the true responsibilities, written or implied, in NAS410/EN4179 and will discuss the difference between the expectations on a Level III vs. the expectations on a Responsible Level III.

Course Summary:

- · What is an NDT Level III
- Capabilities of a Level III
- Activities of a Level III
- Understanding how to write a procedure
- NDT Certification Requirements
- Level III Responsibilities
- Approve written practice
- Flow down to the technician
- Approve training outlines

Course Objectives:

 Provides insight into the expectations of the Aviation Industry concerning a Level III, and promotes discussions concerning items such as creating a written practice, developing work instructions, exam questions, audit criteria and understanding how these activities provide an understanding of the employers NDT system.

AC7114 EXPECTATION

3 hours | \$200 | Webinar

eQuaLearn's AC7114 Expectation is a training course that provides a detailed review of the changes to AC7114 (Nadcap Audit Criteria for Non-Destructive Testing Suppliers Accreditation Program), including clarification of NDT personnel certification requirements to meet Nadcap expectations.

- Rationale and explanation of the latest changes to AC7114.
- Interpretation of the Nadcap NDT Task Group expectation for Audit Criteria compliance.
 - NDT Quality System Requirements (Level 3 Responsibility, Internal NDT Audits, Performance Review, etc).
 - NDT Personnel Certification (Written Practice, Personnel Records, Examinations, Suppler Level 3 Personnel, etc) Equipment Calibration.

ERROR PROOFING YOUR PENETRANT & MAGNETIC PARTICLE REQUIREMENTS

One day | \$550 | Instructor Led Training

The one-day Error proofing your Penetrant and Magnetic Particle Requirements course provides an overview of the internal self-audit requirements for evaluating and assessing the risk of some of the most common findings associated with penetrant and magnetic particle Audit Criteria.

Course Summary:

- Most common findings
- NAS410/EN4179 and AC7114 documentation requirements for MT and PT
- Process Controls, including most common non-conformances
- Compliance, including most common non-conformances

Course Objectives:

- Provide definitions of some common quality terms and tools to use while preparing for your Nadcap audit.
- Provide an overview of the personnel requirements for PT and MT, by reviewing the requirements, looking for the failure modes, and predicting or eliminating the risk from receiving a finding (error proofing your audit criteria requirements).

NADCAP PENETRANT (PT) & MAGNETIC PARTICLE (MT) SELF-AUDIT RISK ASSESSMENT

3 hours | \$200 | Webinar

A webinar designed for reviewing the potential failure modes of some of the most common findings associated with penetrant and magnetic particle Audit Criteria, and the associated NDT quality system questions in the AC7114 Audit Criteria. This is a dynamic course focusing on predicting the failure modes of common findings starting from AC7114 Audit Criteria, through the AC7114/1 and AC7114/2 Audit Criteria. The course content will briefly highlight some of the most common findings documented within the past year to eighteen months.

- A Brief Overview of the personnel requirements of PT & MT, by reviewing and looking for failure modes
- A Brief Overview of the process control requirements for PT & MT, by reviewing and looking for failure modes
- A Brief Overview of the job compliance requirements for PT & MT, by reviewing the requirements and looking for failure modes.

9100

One day | \$500 | Instructor Led Training

eQuaLearn's 9100 course provides a comprehensive review of 9100 and illustrates how compliance leads to continual improvement.

Course Summary:

- Normative References
- Terms and Definition and Implementation to Ensure Compliance
- Quality Management Requirements
- Management Responsibility to Developing, Implementing and Improving Effectiveness of the QMS
- Resource Management to Implement and Maintain a QMS
- Product Realization Management and Planning to meet Requirements in a Structured and Controlled Manner
- Measurement, Analysis and Improvement
- Implementation

Course Objectives:

- Fully understand the requirements of 9100.
- Identify steps necessary for your organization to successfully implement 9100.
- Understand the implications and benefits of 9100.

9100 - CHANGES IN REVISION D

3 hours | \$200 | Webinar

eQuaLearn's 9100 Rev. D course is conducted as a webinar event and provides a detailed review of the changes in 9100 Revision D and suggestions on how to implement these new requirements at your company.

Course Summary:

- AS/EN/JISQ 9100 Rev. D Review of implemented revision
- ISO 9001:2008 Revision and the effect on AS/EN/JISQ 9100
- Rationale and Explanation of the Revision

"This was a great summary of necessary changes for AS9100 companies."

> Quality Engineer PAS Technologies

CONTRACT REVIEW FOR AEROSPACE SUPPLIERS

One day | \$500 | Instructor Led Training

This course is aimed at people who manage contract review in the aerospace industry and those who carry out contract reviews. It covers the components required to establish a system which complies with 9100 requirements and explains, with examples, what is meant by:

Course Summary:

- · What is Contract Review
- Customer Requirements
- Other Requirements
- Review of Requirements and Realization
- Order Handling

Course Objectives:

- Clarify the requirements for Contract Review in the aerospace sector.
- Present the components of a Contract Review system.
- Explain technical requirements particular to aerospace.

All eQuaLearn courses are available as private onsite training sessions scheduled to suit your company needs. Details on page 1.

CONTRACT REVIEW

3 hours | \$200 | Webinar

A webinar for learners who manage or are involved in Contract Review in the aerospace supply chain.

- Enquiries versus Orders.
- Customer communication.
- Determining customer requirements.
- Determining other requirements.
- Supersession rules for specifications.
- · Reviewing realization.
- · Evaluating risk.
- · Kev and Critical characteristics.
- · Change control.
- · Records.

INTERNAL AUDIT SYSTEM

One day | \$500 | Instructor Led Training

The Internal Audit Systems course walks through the process of building a new internal audit system or starting over after a catastrophic failure of the internal audit system. Those in attendance will learn how to structure the essential elements of the system for success. It also explains the vital relationship between Quality and Management which is essential to a successful system.

Course Summary:

- Construction of an Internal Auditing System
- Development of an Internal Auditing System
- Deployment of an Internal Auditing System
- Setting the stage for a successful Internal Auditing System

INTERNAL AUDITOR

One day | \$500 | Instructor Led Training

The Internal Auditor course picks up where the "Internal Audit Systems" course leaves off and walks through the process of choosing, training, and managing internal auditors. In other words it puts the internal audit system into action by presenting the "How To" of performing internal audits and what to do with the results. It not only provides training for internal auditors, but for the entire action team.

- Improving the Internal Audit System
- Authority for the Internal Audit System
- Monitoring the Internal Audit System
- Doing the audits
- Managing the Auditors



INTERNAL AUDIT SYSTEMS OVERVIEW

3 hours I \$200 I Webinar

The Internal Audit Systems
Overview webinar is designed to
assist learners in the process of
building an internal audit system.
This webinar also discusses how
to structure the key elements of
the system for success, as well
as explaining the vital relationship
between Quality and Management.

Course Summary:

- · What are Internal Audits?
- Audit System Plan
- Audit Focus & Approach
- Personal Internal Audits
- Management Support
- System Requirements
- Audit Criteria
- Internal Auditors
- Findings & Observations
- Audit Report & Analysis

INTRODUCTION TO AEROSPACE QUALITY

One day | \$500 | Instructor Led Training

This course will introduce the concept and key definitions of quality in the aerospace industry to professionals who are new to the quality field. It presents Aerospace Quality Management and the role of Nadcap, ISO 9001 and 9100, aerospace audits including what you must know pre- and post-audit, quality tools, remedies to nonconformances, and maintaining the quality system.

Course Summary:

- · Quality in Aerospace
- · Quality Systems
- Role of Nadcap
- · Maintaining Quality and Audits
- · Metrics and Tools
- · Continual improvement

- Clarify the requirements for quality in the aerospace sector.
- Ensure an understanding of the expectations for aerospace quality systems.
- Present tools and techniques expected to be used by quality practitioners in aerospace.

AC7004 - EXPECTATIONS

3 hours | \$200 | Webinar

A review of the changes made to AC7004, Revision F (Nadcap Criteria for Aerospace Quality Systems). The webinar will cover the major changes made to the audit criteria and expectations for compliance.

Course Summary:

- Rationale and explanation of the latest changes to AC7004
- Interpretation of the Nadcap AQS Task Group expectation for Audit Criteria compliance
 - New Terminology
 - New Requirements

All eQuaLearn courses are available as private onsite training sessions scheduled to suit your company needs. Details on page 1.

EFFECTIVE AEROSPACE OUTSOURCING

3 hours | \$200 | Webinar

This course will be useful for companies seeking ISO 9001, AC7004, 9100 and Nadcap accreditation. For accredited companies the course will facilitate continual improvement on these subjects.

The course content will be applicable to staff involved with quality assurance and control, vendor compliance, purchasing and production planning.

- What is outsourcing? Definition and criteria
- Work Transfer. Definition and scope
- Planning a systematic approach
 - Quality systems requirements
 - Supplier selection
 - · Commercial terms
 - Customer requirements
 - · Risk management
 - Process validation
 - Verification criteria
 - Purchasing information

PROBLEM SOLVING TOOLS

One day | \$500 | Instructor Led Training

The course presents an overview of problem solving and Root Cause Corrective Action systems to show the relevance of various tools. Choosing the right tool(s) is critical to getting effective solutions to problems and issues.

Tools require handling and practice, so the course includes exercises and examples to allow the attendees to practice the knowledge and skills presented in a pressure free environment.

Course Summary:

- · Problem Solving and the Toolkit
- The Toolkit
- Flowchart / Process Map
- Is/Is Not analysis
- Tally charts / Location Map
- Pareto
- Brainstorming
- · Cause and Effect diagram
- 5 Whv
- Mistake Proofing

Course Objectives:

- Present the most useful tools used in problem solving and Root Cause Corrective Action.
- Explain how they work.
- Explain how and when to use them.
- Present examples of useful extensions or variants for each tool.

8D PROBLEM SOLVING

2 days | \$999 | Instructor Led Training

8D Problem Solving is a course designed to cover all aspects of using the 8D methodology to contain, solve and eliminate problems. The training includes reference to, and guidance in the use of, common problem solving tools such as Brainstorming, ls/ls-not analysis, 5-why, flowcharting, etc.

Course Summary:

- Initial understanding of 8D, what it is and how it relates to other Quality Planning systems
- Steps of the 8D Structure
 - Contain the event
 - Form team
 - Identify the problem
 - Contain the problem
 - Identify Root Cause
 - Identify Corrective Actions
 - Implement Actions
 - Take Preventative Actions
 - · Recognize the Team
- Assessment

- Understand every step of the 8D problem solving format.
- Being able to complete 8D reports at all stages of the process.
- Meet the "qualified practitioner" requirement of AS13000.

RCCA NADCAP STYLE

3 hours | \$200 | Webinar

eQuaLearn's Root Cause Corrective Action webinar is designed to provide an understanding of the basic concepts of Root Cause Corrective Action (RCCA) and application of how to apply those concepts to eliminate errors and defects. This webinar provides a basic understanding of the requirements needed to respond to a Nadcap audit non-conformance (NCR).

Course Summary:

- Root Cause Corrective Action
- Nadcap Non-Conformance response format
- Nadcap Non-Conformance examples (Good & Bad)

ROOT CAUSE CORRECTIVE ACTION

One day | \$500 | Instructor Led Training

This course provides a systematic approach to cause analysis and will illustrate how to respond to audit findings to ensure problems are fixed and prevented from reoccurring in the future. This one-day, interactive class teaches the process necessary to establish a root cause program that will become a significant continual improvement tool.

Course Summary:

- Containment and Team Development
- Problem Identification
- · Collecting Data
- Determining Causes
- Corrective Action Planning
- Mistake Proofing
- Implementation and Validation

Course Objectives:

- Review the Root Cause Corrective Action flowchart highlights, including containment, problem identification, collection of data and cause determination, corrective action planning, mistake proofing and implementation and validation.
- Assure a thorough understanding of the Nadcap Non-conformance Response Format.

"It's so good, it should be mandatory."

Quality Engineer Viking Aerospace "Excellent explanation of complex topic!"

Engineering Manager Haynes International

PROCESS FAILURE MODES AND EFFECTS ANALYSIS

One day | \$500 | Instructor Led Training

Suggested by the IAQG and required by vehicle builders, the Process Failure Modes and Effects Analysis (PFMEA) one-day course presents the use of Process FMEA as part of Advanced Process Quality Planning in the Aerospace industry. This course also describes the concepts of PFMEA, how it fits into Quality Planning, and the role PFMEA has in Risk Management.

Course Summary:

- What is FMEA and how FMEA fits into APQP
- How to establish PFMEA
- Using and Maintaining the PFMEA

Course Objectives:

- Provide a thorough understanding of the role and practices around PEMEA.
- Explain the components of PFMEA.

STATISTICAL PROCESS CONTROL

One day | \$500 | Instructor Led Training

This course is designed to help organizations apply statistical methods to the monitoring and control of existing processes in order to identify variations in the process, and implement continuous improvement techniques to increase product quality and reduce waste.

Course Summary:

- Why we need SPC
- · What is SPC
- Background Knowledge
- Types of Charts-Run versus Control
- Other Charts
- Related Issues

Course Objectives:

- · Achieve an understanding of SPC.
- Gain skills needed to apply statistical methods to process control.
- Drive quality improvement decisions by objective analysis versus subjective opinions.
- Develop and analyze processappropriate charts.

All eQuaLearn courses are available as private onsite training sessions scheduled to suit your company needs. Details on page 1.

Quality Technician Wallwork Heat Treatment Ltd

[&]quot;Very enjoyable, interesting and well delivered."

MEMBERSHIP

CORPORATE MEMBERSHIP \$6,000

Developed for medium to large size organizations that wish to invest in the development of their staff.

Make a strong commitment to professional development. Enjoy exclusive access to:

- 15% discount on registration fees for unlimited enrollments
- 15% discount on all onsite sessions
- 25 free public webinar enrollments
- Train the Trainer option available eQuaLearn can train an instructor at your company to teach eQuaLearn courses to your staff (additional fees and Term and Conditions apply)
- Other Corporate Membership benefits include:
 - Courses customized to your specific needs
 - Training records/Transcripts
 - Attendance reports
 - · Access to Resource Library and white papers on quality techniques

MEMBERSHIP

COMPANY MEMBERSHIP \$2,000

Uniquely tailored for small to medium size organizations that wish to invest in the development of their staff.

Benefit from the Company Membership and enjoy a tailored experience which includes:

- 15% discount on public courses registration fees for 25 enrollments
- 10% off each onsite session
- 10 free public webinar enrollments
- BONUS: If 25 employees are trained in 12 months in public or onsite sessions, the member is entitled to 2 free public enrollments.
- Additional Company Membership benefits include:
 - · Courses customized for your specific needs
 - Training Records/Transcripts
 - Attendance reports
 - Access to Resource Library and white papers on quality techniques



MEMBERSHIP

INDIVIDUAL MEMBERSHIP \$600

Ideal for small companies or individuals that wish to take more than one eQuaLeam course in one year.

For an introduction to all that eQuaLearn has to offer, join at the Individual level.

- 50% discount for unlimited public enrollment
- 50% discount webinar enrollment
- Additional Individual Membership benefits include:
 - Training Records/Transcripts
 - · Access to Resource Library and white papers on quality techniques

"Great course even though it is free! Usually get what you pay for. This was exceptional." Quality Manager JDS Technologies Inc "My only regret is that I wish I would have attended this class sooner!" Quality Manager AADFW "Sending my employees to the Root Cause Corrective Action training was one of the best business decisions I've made. We have a clear understanding of the task at hand which is a stress reliever." President Advanced Welding Technologies "I have had other classes in the past where the instructors were very poor, making the class poor. However, the instructor for this class was excellent and will definitely take as many classes possible with PRI."

Quality Administrator Smith West LLC

"Substantial learning material presented in a professional manner."

Quality Specialist III Carpenter Technology

"Overall the training was excellent, unique and course materials were easy to follow, and very informative."

> Quality Manager Caparo Fasteners

"I have attended many classes over the last 50 years in aerospace and this was one of the best classes."

Employee Winsted Precision Ball Co.



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