

SKILLS COURSE

CATALOG

Continuous Improvement

Skills Course Descriptions

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CONTINOUS IMPROVEMENT SKILLS

LEAN MANUFACTURING SKILLS COURSES

Lean Principles

LEA-1001 Lean Principles

Course Description

Lean principles are designed to help an organization achieve process perfection. The foundation of lean principles are employee involvement, adding the maximum value, and the elimination of waste. Lean is a journey toward understanding the customer and their needs.

By the end of this course, you will be able to

* Define and describe the concepts of lean, including pull and perfection
* Define and describe the elimination of waste using tools like 5S, kaizen, and poke-yoke
* Use a value stream map to identify waste
* Explain value
* Define value, value-added, and non-value-added
* Identify the terms used to describe waste
* Describe the theory of constraints

Estimated completion time (hours): 1.5 (credit hour 0.2)

Introduction to Lean Manufacturing

LEA-1002 The History of Lean Manufacturing

Course Description

In this course, you’ll learn about the history of lean manufacturing. You’ll discover how the contributions of Henry Ford, Taiichi Ohno, and Shigeo Shingo worked together to form what is today called lean manufacturing. You’ll also find out about the three essential elements of the Toyota Production System.

By the end of this course, you will be able to

* List the major contributions in the history of lean manufacturing
* Identify the principles and practices of using lean manufacturing
* Name the three essential elements of the Toyota Production System

Estimated completion time (hours): 0.9 (credit hour 0.1)

Workplace Organization

LEA-1003 Workplace Organization

Course Description

A disorganized work area not only makes it hard to find items, but it makes working effectively and efficiently difficult as well. In this course, you’ll learn about the importance of workplace organization, the methods used to organize the workplace, and the 5S program.

By the end of this course, you will be able to

* List the principles of workplace organization
* Identify the methods used to organize the workplace
* Recognize the methods used to measure workplace organization

Estimated completion time (hours): 1.1 (credit hour 0.2)

Workplace Organization

LEA-1004 S1: Sort

Course Description

In this course, you’ll learn about the process of Sort. Sort involves getting rid of unnecessary items and general clutter in the work area. Sort helps ensure that only necessary items remain in the workplace.

By the end of this course, you will be able to

* Define the 5S meaning of Sort
* Match Sort with its requirements and compliance activity
* Identify key actions for Sort
* Explain how Sort is executed in the workplace

Estimated completion time (hours): 0.7 (credit hour 0.1)

Workplace Organization

LEA-1005 S2: Straighten

Course Description

In this course, you will learn about Straighten. Straighten is a method for organizing the workplace to reduce wasted steps, motion, and time. You’ll explore techniques designed to help you store tools where they’re needed and visually obvious. You’ll also learn to use outlines and labels to identify the location of machines, walkways, and storage areas.

By the end of this course, you will be able to

* Define the 5S meaning of Straighten
* Match Straighten with its requirements and compliance activity
* Identify key actions for Straighten
* Explain how Straighten is executed in the workplace

Estimated completion time (hours): 0.9 (credit hour 0.1)

Workplace Organization

LEA-1006 S3: Shine

Course Description

In this course, you will learn to Shine. Shine is maintaining order through cleaning. Daily cleaning routines are established to maintain a clean and tidy working environment. You’ll explore steps for keeping equipment clean and in good working order.

By the end of this course, you will be able to

* Define the 5S meaning of Shine
* Match Shine with its requirements and compliance activity
* Identify key actions for Shine
* Explain how Shine is executed in the workplace

Estimated completion time (hours): 0.8 (credit hour 0.1)

Workplace Organization

LEA-1007 S4: Standardize

Course Description

In this course, you will learn about standardizing the Sort, Straighten, and Shine activities. You’ll also discover basic guidance on how to keep the 5S effort active in your organization.

By the end of this course, you will be able to

* Match Standardize with its requirements and compliance activity
* Identify the key actions for Standardize
* Explain how Standardize is executed in the workplace

Estimated completion time (hours): 0.7 (credit hour 0.1)

Workplace Organization

LEA-1008 S5: Sustain

Course Description

The last step of 5S, Sustain, is considered the most difficult step of the 5S process. Sustain is defined as the training and discipline needed to maintain 5S. In this course, you’ll learn why sustaining the 5S effort takes so much work and commitment by everyone.

By the end of this course, you will be able to

* Understand Sustain requirements and compliance activity
* Identify the key action steps for Sustain
* Explain how Sustain is executed in the workplace

Estimated completion time (hours): 0.7 (credit hour 0.1)

QUALITY SKILLS COURSES

Quality Systems

QUA-1001 Introduction to Quality

Course Description

Quality is a term that’s mentioned often, but what does it really mean? This course defines terms, like quality and Total Quality Management (TQM), and how these terms apply to manufacturing companies.

By the end of this course, you will be able to

* Define quality, customer, and expectations
* Identify the source of expectations
* Define quality management systems
* Describe the history of quality management systems
* Define Total Quality Management (TQM)
* List the principles of TQM
* Identify who is involved in quality
* Give examples of how customers and companies benefit from quality systems

Estimated completion time (hours): 1.4 (credit hour 0.2)

Quality Systems

QUA-1002 ISO 9000

Course Description

International standards are a way of overcoming technical barriers to global trade. The most prominent organization that develops these standards is the International Organization for Standardization (ISO).

By the end of this course, you will be able to

* Describe the International Organization for Standardization (ISO)
* Define ISO standard
* Describe the Plan, Do, Check, Act (PDCA) cycle as applied to ISO standards
* State the goals of ISO 9001:2000
* Describe some of the industries impacted by ISO standards

Estimated completion time (hours): 1.1 (credit hour 0.2)

Quality Systems

QUA-1003 Standards Organizations

Course Description

Standards organizations develop, coordinate, distribute, revise, issue, interpret, and otherwise produce standards intended to address the needs of affected adopters.

By the end of this course, you will be able to

* Define standards
* Define technical standards
* Define standards organizations
* Describe the uses of standards
* State the purpose of international standards

Estimated completion time (hours): 0.9 (credit hour 0.1)

Quality Systems

QUA-1004 Quality Organizations

Course Description

Implementing a quality system requires a support organization that spans the entire company. The organizational structure reflects the company structure and the requirements of the products being produced.

By the end of this course, you will be able to

* Define quality organization
* Describe where a quality system comes from
* Identify the four levels of quality documentation
* Identify some typical parts of a quality organization
* Discuss the roles and the challenges quality organizations face
* Explain why quality personnel must be independent

Estimated completion time (hours): 0.9 (credit hour 0.1)

Quality Systems

QUA-1005 Basic Quality Roles and Responsibilities

Course Description

Quality assurance is a company-wide effort with responsibilities extending to every employee. Within a company’s quality program, there are a few basic roles with responsibilities that must be fulfilled.

By the end of this course, you will be able to

* Define role
* Define responsibilities
* Define fulfillment of requirements
* Describe the roles and responsibilities of Quality Assurance personnel
* Define inspection
* Describe the inspection process

Estimated completion time (hours): 1.0 (credit hour 0.1)

Quality Management

QUA-1006 Quality Concepts

Course Description

Quality is based on the wants, needs, and expectations of the customer. In this course, you will be introduced to the concepts of product quality, the types of customers and how to meet their expectations.

By the end of this course, you will be able to

* Define product quality
* Identify the difference between internal and external customers
* Define specification
* Define tolerance and explain its importance
* Identify the roles of management and production workers regarding quality
* Describe how quality teams work

Estimated completion time (hours): 0.9 (credit hour 0.1)

Quality Management

QUA-1007 The Cost of Quality

Course Description

Producing quality products costs money. Where the company spends money producing quality products is an indicator of their commitment to the customer and to the long-term sustainability of the company.

By the end of this course, you will be able to:

* Define the cost of quality
* Categorize quality activities into one of the four classifications of quality
* Differentiate between prevention and appraisal costs
* Explain the difference between internal and external failure costs
* Describe the Six Sigma quality system

Estimated completion time (hours): 0.9 (credit hour 0.1)

Quality Management

QUA-1008 Managing Quality

Course Description

Quality planning, quality control, and quality improvement are essential to the success of a quality program. Organizations that are serious about quality have robust quality management systems to ensure these activities are properly supported and implemented.

By the end of this course, you will be able to:

* Define the three key elements of quality and explain how they are related
* Define quality planning
* Define quality control
* Define quality improvement
* Explain the impact of quality improvement on productivity
* Explain the importance of data collection and analysis to quality
* Describe quality audit

Estimated completion time (hours): 1.1 (credit hour 0.2)

Quality Management

QUA-1009 Quality Documents

Course Description

The heart of any quality system is documentation. Documents tell you how and when to perform tasks, and they also serve as a permanent record that the tasks were completed. In this course, you will learn the purpose and types of documentation used in a quality system.

By the end of this course, you will be able to

* Identify the levels of documentation in a quality system
* Describe the purpose of a policy
* Describe the purpose of a procedure
* Describe the purpose of a work instruction
* Define document control
* Describe a technical manual
* Identify the benefits of electronic data interchange

Estimated completion time (hours): 0.9 (credit hour 0.1)

Quality Management

QUA-1010 Corrective and Preventive Action

Course Description

Corrective and preventive actions are designed to eliminate the causes of nonconformities. They are a requirement of ISO 9000 and many other quality systems.

By the end of this course, you will be able to

* Explain the difference between corrective and preventive action
* List the steps of the corrective action process
* Explain the importance of the corrective action report
* Define the purpose of a Material Review Board

Estimated completion time (hours): 0.8 (credit hour 0.1)

Introduction to Statistical Process Control

QUA-1011 Introduction to SPC

Course Description

Statistical Process Control, or SPC, is a quality control methodology that uses statistics to predict variation in processes. Developed in the 1920s, SPC is widely used by manufacturing companies to maintain the quality of the products they produce.

By the end of this course, you will be able to

* Define statistical process control
* Identify and explain the three basics of statistical process control
* Explain the types of variation that exist in a process
* Explain the history of statistical process control

Estimated completion time (hours): 1.0 (credit hour 0.1)

Introduction Statistical Process Control

QUA-1012 Probability and Variation

Course Description

Probability and variations are the foundation of SPC. The mathematical rules of probability can help to accurately predict the variation in any process.

By the end of this course, you will be able to

* Identify the different types of variation
* Define and explain the six common causes of variation
* Explain the principles of probability
* Calculate the probability of an event
* Construct a histogram
* Explain the concepts of standard deviation

Estimated completion time (hours): 1.8 (credit hour 0.3)

Introduction Statistical Process Control

QUA-1013 The Control Chart

Course Description

The control chart is a tool used in Statistical Process Control to determine if a manufacturing process is in a state of statistical control. Control charts achieve this by comparing real-time process information with historical process data.

By the end of this course, you will be able to

* Define the purpose of a control chart
* Explain the fields on a control chart
* Prepare a new control chart
* Calculate X-bar
* Calculate X-double bar
* Calculate R-bar

Estimated completion time (hours): 1.2 (credit hour 0.2)

Advanced Statistical Process Control

QUA-2001 Control Chart Analysis

Course Description

Analyzing the data on your control chart will help you keep your processes in a state of statistical control. This course provides a few rules and guidelines that will help you identify potential problems before the process creates defective products.

By the end of this course, you will be able to

* Prepare a control chart for analysis
* Explain the eight basic control chart tests
* Analyze the averages chart
* Analyze the range chart

Estimated completion time (hours): 0.9 (credit hour 0.1)

Advanced Statistical Process Control

QUA-2002 Process Capability

Course Description

Process capability is a measure of the ability of a process to produce products that meet or exceed the engineering requirements. It is the standard for evaluating the statistical capability of a manufacturing process.

By the end of this course, you will be able to

* Define process capability
* Define specification limits
* Calculate process capability
* Calculate the process capability index
* Explain how the location of the process mean impacts process capability

Estimated completion time (hours): 1.0 (credit hour 0.1)

Advanced Statistical Process Control

QUA-2003 Problem Solving Tools

Course Description

Problem solving tools are used to identify the root causes of problems in a process. They are designed to create a methodical path towards problem resolution.

By the end of this course, you will be able to

* List the seven quality control tools
* Define and explain the seven basic quality tools
* Create a cause-and-effect diagram
* Create a check sheet
* Create a histogram
* Create a pareto chart
* Create basic graphs

Estimated completion time (hours): 1.1 (credit hour 0.2)

Advanced Statistical Process Control

QUA-2004 Problem Solving

Course Description

Problem solving is one of the most difficult things you will ever do. It requires a strong mind, willpower, and knowledge of problem solving processes to get to the root cause of difficult problems.

By the end of this course, you will be able to

* Explain the Plan, Do, Check, Act cycle
* Define the required tasks for each step of the Plan, Do, Check, Act cycle
* Identify how the seven quality tools are used in the Plan, Do, Check, Act Cycle

Estimated completion time (hours): 0.9 (credit hour 0.1)

SIX SIGMA SKILLS COURSES

Six Sigma and the Organization

SIX-3001 Six Sigma and the Organization

Course Description

Six Sigma is the structured, disciplined pursuit of near perfection in the products or services an organization produces.

It is based on statistical techniques and tools, and attempts to improve an organization’s bottom line by eliminating the variation in business processes that can result in defects.

By the end of this course, you will be able to

* Define the origins of Six Sigma
* Recognize why organizations use Six Sigma
* Explain how they apply its philosophy and goals
* Describe how process inputs, outputs, and feedback impact the larger organization
* Recognize key drivers for business and how key metrics and scorecards are developed
* Describe the project selection process
* Explain when to use Six Sigma improvement methodology as opposed to other problem-solving tools
* Explain how a project supports and is linked to organizational goals

Estimated completion time (hours): 1.9 (credit hour 0.3)

Six Sigma and the Organization

SIX-3003 Design for Six-Sigma

Course Description

Design for Six Sigma (DFSS) is an application of Six Sigma that encompasses the product design and redesign processes. DFSS makes certain that the voice of the customer is built into every new product and service.

By the end of this course, you will be able to

* Describe how quality function deployment fits into the overall DFSS process
* Define the purpose of the QFD
* Create a QFD matrix
* Explain the purpose of process and design failure mode and effects analyses (PFMEA and DFMEA)
* Calculate the RPN value for a PFMEA and DFMEA
* Explain the differences between a PFMEA and a DFMEA

Estimated completion time (hours): 1.0 (credit hour 0.1)

Six Sigma Define

SIX-3004 Process Elements for Projects

Course Description

A Six Sigma project often requires a large amount of time from many people, and can be quite costly to the organization. The define portion of the DMAIC continuous improvement model provides the information and tools necessary to identify the issue causing decreased customer satisfaction, and to ensure the project will be a value-added activity.

By the end of this course, you will be able to

* Define components of processes
* Define process boundaries
* Describe the difference between internal and external customers
* Define process owner
* Define process stakeholder
* List some means of identifying customers
* Identify means for collecting customer data

Estimated completion time (hours): 1.2 (credit hour 0.2)

Six Sigma Define

SIX-3005 Project Management Basics

Course Description

Basic project management techniques are key contributors to the success of a Six Sigma project. Creating a project charter and performing risk analysis during the define phase helps a Six Sigma project stay on target and addresses potential risks.

By the end of this course, you will be able to

* List the contents of a project charter
* Define problem statement
* Define purpose
* Define benefits
* Define scope
* Define results
* State the benefit of project risk analysis

Estimated completion time (hours): 1.1 (credit hour 0.2)

Six Sigma Define

SIX-3006 Management and Planning Tools

Course Description

The success of a Six Sigma project depends on accurately identifying the current state of a process, and then assessing the problems within the process. A number of management and planning tools are available for this purpose.

By the end of this course, you will be able to

* Define affinity diagram
* Define interrelationship diagraph
* Define tree diagram
* Define prioritization matrix
* Define PDPC
* Define activity network diagram
* Define matrix diagram
* Identify types and uses of matrix diagrams

Estimated completion time (hours): 0.7 (credit hour 0.1)

Six Sigma Define

SIX-3007 Business Results for Improvement Projects

Course Description

To complete the define phase of a Six Sigma project, it's necessary to be able to assess its performance. Business results are measurements of performance that can be applied to the business, project, or process.

By the end of this course, you will be able to

* Define Defects per Unit (DPU)
* Define Rolled Throughput Yield (RTY)
* Define Defects per Million Opportunities (DPMO)
* Describe sigma level
* Describe process capability indices

Estimated completion time (hours): 1.1 (credit hour 0.2)

Six Sigma Define

SIX-3008 Project Team Dynamics and Performance

Course Description

To be successful, a Six Sigma project must be executed by an effective team. Teams evolve over time, passing through definite phases of evolution until they find their place in the organization's Six Sigma structure.

By the end of this course, you will be able to

* Define and describe the stages of team evolution
* List the different roles in a Six Sigma team
* Define brainstorming
* Define nominal group technique
* Define multivoting

Estimated completion time (hours): 1.3 (credit hour 0.2)

Six Sigma Define

SIX-3009 Problem Solving Tools

Course Description

A wide variety of tools exist for use in the define phase of a Six Sigma project. Each tool can provide insight into an organization's processes and help with the development of a good project plan.

By the end of this course, you will be able to describe the following common define phase tools:

* Surveys
* Focus groups
* Interviews
* Audits
* Cause and effect diagrams
* Check sheets
* Graphical charts
* Sampling plans
* Advanced Quality Planning (AQP)
* Benchmarking
* Force field analysis
* Gantt charts
* Project Evaluation and Review Technique (PERT)/Critical Path Method (CPM)

Estimated completion time (hours): 1.9 (credit hour 0.3)

Six Sigma Measure

SIX-3010 Process Analysis and Documentation

Course Description

The measure portion of the DMAIC methodology provides a Six Sigma team with the tools needed to focus the project on possible causes of problems and solutions to those causes.

By the end of this course, you will be able to

* Identify and review process maps, written procedures, and work instructions
* Identify process input variables and process output variables
* Recognize the relationships between input variables and output variables

Estimated completion time (hours): 1.0 (credit hour 0.1)

Six Sigma Measure

SIX-3011 Probability and Statistics

Course Description

In today’s business world, companies cannot remain competitive if they must measure every product’s weight, color, size, strength, and any other characteristic 100 percent. Organizations use probability and statistics to measure samples of a product and provide mathematical proof of the quality of the product or process.

By the end of this course, you will be able to

* Define probability
* Describe and apply probability concepts
* Define statistics
* List statistical parameters
* Distinguish between descriptive and inferential statistics
* Distinguish between a population parameter and a sample statistic
* Define a central limit theorem and its significance in statistics

Estimated completion time (hours): 2.1 (credit hour 0.3)

Six Sigma Measure

SIX-3012 Collecting and Summarizing Data

Course Description

To improve a process or product it is important to know its current status and its status after improvements are made. Valid data must be collected and summarized to verify the status of the process or product.

By the end of this course, you will be able to

* Identify continuous or variable data
* Identify discrete or attribute data
* Describe and define nominal, ordinal, interval, and ratio measurement scales
* Define and apply methods for collecting data
* Define and apply techniques such as random sampling, stratified sampling, and sample homogeneity
* Depict relationships by constructing, applying, and interpreting diagrams and charts

Estimated completion time (hours): 1.7 (credit hour 0.2)

Six Sigma Measure

SIX-3013 Probability Distributions

Course Description

A random experiment or sample can result in different outcomes. The probability that each outcome will occur can be calculated and charted using different probability distributions.

By the end of this course, you will be able to

* Describe and interpret normal, binomial, Poisson, t, chi square, and F distributions
* Identify formulas for calculating the probability of data values of different probability distributions

Estimated completion time (hours): 2.2 (credit hour 0.3)

Six Sigma Measure

SIX-3014 Measurement System Analysis

Course Description

Data often consists of measurements of characteristics or conditions. A measurement system analysis is necessary to identify measurement variation and distinguish between measurement and process variation.

By the end of this course, you will be able to

* Define measurement system analysis
* Identify and conduct gauge repeatability and reproducibility studies
* Define measurement terms including sensitivity, accuracy, precision, bias, and linearity

Estimated completion time (hours): 2.5 (credit hour 0.4)

Six Sigma Measure

SIX-3015 Process Capability Performance

Course Description

A main goal of a Six Sigma project is to reduce variation in a process. To meet this goal, the Six Sigma team must know the capability and performance of the process before and after improvements are implemented.

By the end of this course, you will be able to

* Describe the process of conducting a process capability study
* Distinguish between natural process limits and specification limits
* Define and calculate process capability indices
* Define and calculate process performance indices
* Describe the differences between short-term and long-term capability

Estimated completion time (hours): 1.9 (credit hour 0.3)

Six Sigma Analyze

SIX-3016 Exploratory Data Analysis

Course Description

Before any problem can be eliminated or controlled, the cause of the problem must be identified and confirmed. Six Sigma teams use statistical tools to perform an analysis of data to identify and confirm the variable that causes most variation in a process or product.

By the end of this course, you will be able to

* Create and interpret multi-vari studies
* Identify the differences between positional, cyclical, and temporal variations
* Identify the largest source of variation in a process using a multi-vari study
* Interpret the linear correlation coefficient
* Determine the statistical significance of a linear correlation coefficient
* Identify the equation for linear regression

Estimated completion time (hours): 1.9 (credit hour 0.3)

Six Sigma Analyze

SIX-3017 Hypotheses Test Basics

Course Description

Hypotheses tests are statistical methods of making decisions on the results of a study to determine if the results are truly related, or if they occur by chance. Hypotheses tests differ in the results they produce and what information is required, but they all share some basic terms and concepts.

By the end of this course, you will be able to

* Define and distinguish between statistical significance and practical significance
* Apply tests for significance level, power, and type I and type II errors
* Define null and alternative hypotheses
* List acceptable null and alternative hypotheses for statistical parameters
* Determine appropriate sample size for various tests
* Define confidence levels and confidence intervals
* Calculate confidence intervals for population parameters

Estimated completion time (hours): 1.5 (credit hour 0.2)

Six Sigma Analyze

SIX-3018 Hypotheses Tests

Course Description

Six Sigma teams must understand the difference between the types of hypotheses tests to determine the proper test for the problem. Selection of the proper test is determined by the statistical parameter to be tested and the available information from the sample data.

By the end of this course, you will be able to

* List common hypotheses tests
* Define and describe paired-comparison hypotheses tests
* Define terms related to one-way ANOVAs and interpret their results and data plots
* Define and interpret chi-square and use it to determine statistical significance

Estimated completion time (hours): 2.7 (credit hour 0.4)

Six Sigma Improve and Control

SIX-3019 Design of Experiments

Course Description

Properly designed experiments are essential to improving a Six Sigma project and making the project successful.

By the end of this course, you will be able to

* Define terms associated with the design of experiments
* Interpret main effects of a factor
* Interpret interaction plots

Estimated completion time (hours): 1.3 (credit hour 0.2)

Six Sigma Improve and Control

SIX-3020 SPC

Course Description

Statistical Process Control, or SPC, is a quality control methodology that uses statistics to predict variation in processes. SPC is the basis for the control portion of a Six Sigma project.

By the end of this course, you will be able to

* Define statistical process control
* Define and describe the objectives and benefits of statistical process control
* Explain the types of variation that exist in a process
* Define and describe how rational subgrouping is used
* Identify, select, construct, and apply various control charts
* Interpret various control charts

Estimated completion time (hours): 1.7 (credit hour 0.2)

Six Sigma Improve and Control

SIX-3021 Implement and Validate

Course Description

Improvements to a process are almost always needed to meet the goals of an organization. Many Six Sigma tools can be used to implement and validate the improvements.

By the end of this course, you will be able to

* List the steps to improve a process
* Identify Six Sigma tools used to improve a project
* Identify Six Sigma tools used to validate improvement efforts

Estimated completion time (hours): 0.8 (credit hour 0.1)

Six Sigma Improve and Control

SIX-3022 Control Plans

Course Description

The control plan is one of the most important documents used to maintain the gains made during the analysis and improve portions of a Six Sigma project. The control plan is a “living” document that is continually updated to capture continuing improvements.

By the end of this course, you will be able to

* Define the minimum requirements for a control plan
* List sources of information for a control plan
* List required documents based on a control plan
* Define a dynamic control plan

Estimated completion time (hours): 1.0 (credit hour 0.1)