

# Lean Bronze Certification Blueprint



**LEAN**<sup>™</sup>  
*certification*

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The Lean Certification Blueprint provides additional useful information beyond the Body of Knowledge. The Body of Knowledge specifies the competencies, topics, and subtopics required by different types of lean professionals. The Blueprint goes one step further by specifying the segments of the relevant Body of Knowledge covered by the specific professional certification, and provides detail on the level of proficiency expected for each certification. The Blueprint codifies the content that lean certification addresses in terms of terminal learning objectives (TLOs) and enabling learning/certification objectives (ELOs).

## Lean Bronze Certification Blueprint

**TLO1: A Lean Bronze professional will be able to define and describe principles of cultural enablers within work cells or work groups.**

- 1.1.1 Explain the principle of respect for the individual in lean cultures.
- 1.1.2 Explain the principle of humility in enabling personal and organizational learning and improvement.

**TLO2: A Lean Bronze professional will be able to explain and apply the processes for cultural enablers within work cells or work groups.**

- 1.2.1 Identify the value of planning and deployment in a lean implementation.
- 1.2.2 Discuss the importance of creating a sense of urgency in an organization.
- 1.2.3 Describe the lean principles, values, and philosophies through action and dialogue.
- 1.2.4 Explain the purpose and function of message deployment, including establishing a vision and direction.
- 1.2.5 Describe the benefits of integrating learning and coaching into the organization's culture and types of learning.
- 1.2.6 Describe and apply various types of people development in a lean culture, including education, training, and coaching.
- 1.2.7 Apply motivation, empowerment, and involvement processes in an organization's culture
- 1.2.8 Describe how environmental systems (e.g., area cleanliness, lighting, HVAC) impact the respect for the individual.
- 1.2.9 Describe how safety systems (e.g., product safety, work safety) impact the respect for the individual.

**TLO3: A Lean Bronze professional will be able to discuss and implement techniques and practices of cultural enablers within work cells or work groups.**

- 1.3.1 Identify the purpose and benefits of cross training employees in an organization.
- 1.3.2 Explain the concept and purpose of a skills assessment for training and employee advancement.
- 1.3.3 Explain the use of clear instructions and goals in a learning event.
- 1.3.4 Develop and conduct on-the-job training for new and/or experienced employees.
- 1.3.5 Describe the concepts, purpose and difference between coaching and mentoring.
- 1.3.6 Explain the concepts of motivation, coaching for performance, establishing expectations, and managing change.
- 1.3.7 Lead the formation and management of a work team.
- 1.3.8 Understand the implications of and methods for increasing information sharing and sharing best practices (Yokoten).
- 1.3.9 Describe key elements of suggestion systems.

**TLO4: A Lean Bronze professional will be able to describe and apply the basic principles and philosophies of continuous process improvement within work cells or work groups.**

- 2.1.1 Identify the importance of a process focus (e.g., allocate time to the floor, measure the process to highlight misses and glitches).
- 2.1.2 Describe the concept and approaches to identification and elimination of barriers to flow.
  - 2.1.2.1 Discuss concepts and principles related to flow.
  - 2.1.2.2 Explain the 7 original Wastes (Muda), reducing fluctuation (Mura), and minimizing overburden (Muri).
  - 2.1.2.3 Connect and align value added process steps to eliminate waste and maximize value.
  - 2.1.2.4 Apply strategies to layout processes to create flow.
  - 2.1.2.5 Develop processes and share best practices to make end-to-end flow visible.
  - 2.1.2.6 Implement methods to manage the flow visually to make process conditions apparent.
- 2.1.3 Describe the purpose and function of matching the rate of production to the level of customer demand (Just-In-Time).
- 2.1.4 Implement scientific thinking as a thought process through experimentation and experimental learning.
  - 2.1.4.1 Create methods and systems to stabilize processes.
  - 2.1.4.2 Explain elements and key features of work standardization.
  - 2.1.4.3 Describe concepts which support the recognition of abnormalities.
  - 2.1.4.4 Utilize go and see to identify abnormalities and opportunities for improvement.

- 2.1.5 Explain the purpose and objectives of autonomation (jidoka).
  - 2.1.5.1 Describe the concept and elements of quality at the source (e.g., standard work, successive checks, self-checks, visual management, poka-yoke, continuous improvement).
  - 2.1.5.2 Explain the concept and purpose of no defects passed forward.
  - 2.1.5.3 Explain the concept related to separate man from machine.
  - 2.1.5.4 Describe the purpose of multi-process handling in continuous process improvement.
  - 2.1.5.5 Discuss the purpose for self-detection of errors to prevent defects.
  - 2.1.5.6 Apply the stop and fix principle to prevent a reoccurrence of the defect.
- 2.1.6 Describe improvement with routine work to continually improve the organization.
- 2.1.7 Apply seek perfection principles to help achieve continuous improvement.
  - 2.1.7.1 Explain the purpose, function, and use of incremental continuous improvement (Kaizen).
  - 2.1.7.2 Explain the purpose, function, and use of breakthrough continuous improvement (Kaikaku).

**TLO5: A Lean Bronze professional will be able to describe and apply the continuous process improvement systems within work cells or work groups.**

- 2.2.1 Explain the concept and function of a visual workplace.
  - 2.2.1.1 Describe the purpose, process, and elements of 5S standards and disciplines.
- 2.2.2 Discuss the concept and purpose of lot size reduction.
- 2.2.3 Explain the benefits and main components (i.e., total volume, model sequence, model volume) of load leveling.
- 2.2.4 Identify the function and steps needed to conduct a 3P Production Process Preparation.
- 2.2.5 Describe the purpose, components, and metrics of total productive maintenance.
- 2.2.6 Establish standard work for a task, including the three core elements (takt time, work sequence, and standard in-process stock).
- 2.2.7 Explain the use of built-in feedback systems.
- 2.2.8 Describe the function and benefits of a strategic business assessment.
- 2.2.9 Describe continuous improvement process methodologies used in organizations.
  - 2.2.9.1 Apply the Plan-Do-Check-Act (PDCA) continual improvement methodology.
  - 2.2.9.2 Identify the steps and key components of DMAIC.
  - 2.2.9.3 Describe a problem solving storyboard.
- 2.2.11 Identify the purpose and function of corrective action systems.
  - 2.2.11.1 Apply a root cause analysis to analyze a problem.
- 2.2.12 Explain core concepts of project management (e.g., project charter, Gantt chart).

- 2.2.13 Describe the purpose and components of process design.
- 2.2.14 Explain the purpose, function, and types (i.e., supermarket, sequential, mixed) of pull systems in lean manufacturing.
- 2.2.15 Define knowledge transfer and types of wastes of knowledge (e.g., handoff, useless information, discarded knowledge).

**TLO6: A Lean Bronze professional will be able to describe and apply the continuous process improvement techniques, tools, and practices within work cells or work groups.**

- 2.3.1 Apply different methods of work flow analysis.
  - 2.3.1.1 Construct a flowchart to evaluate work flow and identify areas for process improvements.
  - 2.3.1.2 Describe the components of a flow analysis chart (processing, inspection, transportation, process delay, lot delay).
  - 2.3.1.3 Understand value stream mapping to identify value added activities/steps and waste producing activities/steps.
  - 2.3.1.4 Complete takt time analysis to determine if process is meeting customer demand.
- 2.3.2 Conduct data collection and produce presentations using basic statistical tools (e.g., histograms, pareto analysis, check sheets).
  - 2.3.2.1 Explain the purpose, use, statistics, and methods of interpretation for histograms.
  - 2.3.2.2 Develop a pareto chart to focus improvement efforts or assist in understanding a problem.
  - 2.3.2.3 Utilize a check sheet to collect and record data at the location of the data source.
- 2.3.3 Identify the root cause by using the appropriate tools (e.g., fishbone, 5 Whys) (look beyond the symptoms).
  - 2.3.3.1 Construct a cause and effect (fishbone) diagram to identify potential causes for an effect/problem.
  - 2.3.3.2 Apply the 5-Whys technique to arrive at the root cause of a problem.
  - 2.3.3.3 Discuss the purpose and function of failure mode and effects analysis.
- 2.3.4 Conduct analyses to present variation data.
  - 2.3.4.1 Compute statistical process control charts to monitor, study, and understand process behavior over time.
  - 2.3.4.2 Explain the purpose and function of scatter and concentration diagrams.
- 2.3.5 Apply methodology of Lean product and service design.
  - 2.3.5.1 Understand the importance of concurrent engineering during concept and design phases.
  - 2.3.5.2 Discuss the purpose and components quality function deployment.
  - 2.3.5.3 Conduct product or process benchmarking.

- 2.3.5.4 Explain the design for product life cycle (DFx) process.
- 2.3.5.5 Analyze and apply product and component variety reduction.
- 2.3.5.6 Develop and execute strategies to achieve design for manufacturability.
- 2.3.6 Apply various lean tools to prepare for improvement efforts (e.g., individual, work teams, kaizen blitz).
  - 2.3.6.1 Participate or conduct a kaizen blitz (e.g., kaizen event, rapid improvement event).
- 2.3.7 Utilize countermeasure activities (e.g., mistake-and error-proofing) to reduce or eliminate root causes of problems.
  - 2.3.7.1 Apply mistake and error proofing (Poka Yoke).
  - 2.3.7.2 Apply quick changeover/setup reduction (SMED) technique.
  - 2.3.7.3 Explain the technique and purpose of one piece flow.
  - 2.3.7.4 Describe the concept, benefits, and process of right sized equipment.
  - 2.3.7.5 Identify the purpose, process, and key elements of cellular flow.
  - 2.3.7.6 Describe the primary functions and examples of sensible automation.
  - 2.3.7.7 Describe the objectives, rules, and benefits of material signals (Kanban).
  - 2.3.7.8 Define the concept and benefits of source inspection.
- 2.3.8 Describe the external supply process.
  - 2.3.8.1 Define supplier managed inventory and the benefits for the external supplier, the internal process, and the value stream.
  - 2.3.8.2 Identify the purpose and function of cross-docking.
  - 2.3.8.3 Describe the purpose and benefit to the value stream of supplier assessment and feedback.
  - 2.3.8.4 Describe the concept and value of supplier development to the overall value stream.
  - 2.3.8.5 Identify various types of supplier benchmarking (e.g., internal, competitive, functional).
  - 2.3.8.6 Remove from Bronze Blueprint.
- 2.3.9 Describe internal supply process.
  - 2.3.9.1 Apply methods to minimize waste during material handling.
  - 2.3.9.2 Discuss the methods and benefits of minimizing warehousing.
  - 2.3.9.3 Describe the considerations and challenges of planning and scheduling.

**TLO7: A Lean Bronze professional will be able to describe and apply the principles of consistent lean enterprise culture within work cells or work groups.**

- 3.1.1 Explain systemic thinking to build a culture that is value stream focused.
  - 3.1.1.1 Explain the importance of part-whole relationships which are clear and explicit through holistic thinking.
  - 3.1.1.2 Describe the how the organization evolves as necessary to accommodate future conditions through dynamic thinking.
  - 3.1.1.3 Describe methods of closed-loop thinking to assure effective feedback of organizational learning (e.g., Deming's PDCA cycle).
- 3.1.2 Explain the value and implementation of constancy of purpose to the lean enterprise culture.
  - 3.1.2.1 Identify the purpose and function of focusing on results.
  - 3.1.2.2 Apply the concept of focus on waste elimination to a project.
  - 3.1.2.3 Focus on value to the customer during work groups and projects.
- 3.1.3 Describe the importance of social responsibility (e.g., environmental impact) to the organization's success.

**TLO8: A Lean Bronze professional will be able to describe the processes or systems for developing and maintaining a consistent lean enterprise culture within work cells or work groups.**

- 3.2.1 Describe the value of enterprise thinking within an organization.
  - 3.2.1.1 Describe how organizations organize around flow to eliminate traditional boundaries between internal customers and suppliers.
  - 3.2.1.2 Explain the necessity to integrate business systems and improvement systems.
  - 3.2.1.3 Understand the need to reconcile reporting systems (across functions) that track lean improvement activities.
  - 3.2.1.4 Describe management of information to drive enterprise thinking.
- 3.2.2 Describe policy deployment/strategy deployment (Hoshin Kanri).
  - 3.2.2.1 Understand the steps involved in scientific thinking as a strategic process.
  - 3.2.2.2 Understand use of a series of nested experiments to understand the cause and effect.
  - 3.2.2.3 Understand the dynamic give and take process to receiving feedback (catchball).
  - 3.2.2.4 Understand the consensus process as it relates to strategy deployment within a group to move forward.
  - 3.2.2.5 Understand the different levels of correlation to emphasize alignment and prioritize the initiative.
  - 3.2.2.6 Understand standard work for strategic planning communication to keep track of progress.
  - 3.2.2.7 Understand resource deployment and allocation.

**TLO9: A Lean Bronze professional will be able to describe and apply the techniques, practices, and tools for developing and maintaining a consistent lean enterprise culture within work cells or work groups.**

- 3.3.1 Use the A3 process to capture knowledge, the process problem analyzed, and learning.
- 3.3.2 Understand the catchball process.
- 3.3.3 Understand the necessity to redeploy resources where demand is required.

**TLO10: A Lean Bronze professional will be able to describe the principles of business results within work cells or work groups.**

- 4.1.1 Distinguish value in customer loyalty to measure and drive performance.
  - 4.1.1.1 Understand what matters to the customer to align, streamline, and simplify work processes.
  - 4.1.1.2 Identify normal conditions from abnormal conditions to trigger the correct response.
  - 4.1.1.3 Discuss guidelines for measurement categories to achieve better results through alignment, visibility, and feedback.

**TLO11: A Lean Bronze professional will be able to describe and apply measurement systems.**

- 4.2.1 Identify precision and accuracy in measurement systems.
  - 4.2.1.1 Understand the interdependencies between measures and measurement categories (e.g., attribute measures, variable data, KPIs).
  - 4.2.1.2 Explain internal measures that matter to the customer.
  - 4.2.1.3 Understand measurement results from the whole system to maximize value.
  - 4.2.1.4 Utilize measurement system to measure and expel waste and barriers to flow
  - 4.2.1.5 Awareness of a lean accounting system to measure and optimize business practices.
  - 4.2.1.6 Understand needs and expectations of those who purchase/use your products.
- 4.2.2 Identify the goals and objects to improve the organization's vision.
  - 4.2.2.1 Awareness of SMART (Specific, Measurable, Achievable, Realistic, Timely) goals to improve the organization.
  - 4.2.2.2 Understand that organization's goals and objectives are tied to the customer
- 4.2.3 Identify the factors from analysis that influence the process.
- 4.2.4 Describe and report to stakeholders any issue of product flow, backlogs, and quality problems.
  - 4.2.4.1 Utilize visual methods to provide feedback in real-time.



**TLO12: A Lean Bronze professional will be able to understand and apply key lean related measures.**

- 4.3.1 Create and report quality measures to establish value for the customer, including rework, and first pass yield.
  - 4.3.1.1 Implement measures that immediately identify sources of rework.
  - 4.3.1.2 Identify a first pass yield to measure the organization's ability to work efficiently.
- 4.3.2 Create and report delivery measures (i.e., on time delivery), including takt time, cycle time, and lead time.
  - 4.3.2.1 Use takt time to measure the pace of work to meet the customer demand.
  - 4.3.2.2 Maintain cycle time to measure the time required to complete a task.
  - 4.3.2.3 Compute the lead-time to measure the unit's process from start to finish.
- 4.3.3 Create or report cost measurements, including inventory turns, queue time, wait time (delays), Overall Equipment Effectiveness (OEE), changeover time.
  - 4.3.3.1 Understand inventory turns.
  - 4.3.3.2 Compute the queue time a product waits at the next fabrication step.
  - 4.3.3.3 Evaluate the wait time in a process to measure the duration of delay in the process.
  - 4.3.3.4 Understand Overall Equipment Effectiveness of the labor process and plant efficiency.
  - 4.3.3.5 Calculate the changeover time from one product to another.
- 4.3.4 Understand the financial impact of lean processes to the organization.
  - 4.3.4.1 Understand the impact of lean on cash flow.
- 4.3.5 Understand the impact that lean tools have on competitive markets, including customer satisfaction.
  - 4.3.5.1 Understand customer satisfaction.