UNIT 1 LEAN CONCEPTS

Lesson 1 | Why Lean?
• Be customer focused: Be on-time, responsive, flexible, and fast.
• Simplify and standardize workflows: Mimic continuous flow, minimize WIP, use visible measures.
• Manage capacity: Increase process uptime, reduce set-up times, find "lost" capacity.
• Eliminate waste: Identify non-value adding activities, then modify, combine, or eliminate those tasks.
• JIT: Not too early and never late; not just-in-case inventory but just-in-time production and delivery; products must always be made right the first time; equipment must always work when needed.

Lesson 2 | Lean Terminology
• Terms
• Tools
• Techniques

Lesson 3 | Eliminate Waste
• Match lot sizes to customer demands: Use kanbans; end WIP.
• Use pull scheduling instead of push scheduling.
• Schedule to the rate-determining step (the bottleneck), then de-bottleneck process lines.
• Facilitate fast feedback: Arrange sequential operations next to each other to ensure fast feedback from internal customer operations to internal supplier operations if something in-process is not right.

Lesson 4 | Components of Lean

Lesson 5 | Value Stream Analysis
• Map the process from incoming order to outgoing product: Define process goals, create the current state map, and establish process metrics.
• Use the current state map to identify potential improvements, conceive the future state.

Lesson 6 | The Lean Mindset
• Eliminating waste is not limited to manufacturing; the same techniques apply to the office, sales, finance, maintenance, and even R&D processes and procedures.
• Lean and Six Sigma are complementary.

Unit 1 Challenge
• An assessment of the learner's progress in this unit.

UNIT 2 LEAN PRACTICES

Lesson 1 | Streamlining the Value Stream
• Identify process goals.
• Collect and analyze process data.
• Create a macro-facility workflow to determine how to minimize high volume travel distances.
• Conduct a micro-process workflow to apply cellular concepts, identify and remove bottlenecks, and move to pull manufacturing with kanbans.
Lesson 2 | Workplace Organization

- Apply the 5Ss: Sort (clearing the work area), Set in Order (designating locations), Shine (cleanliness and workplace appearance), Standardize (everyone doing things the same way), and Sustain (ingraining it in the culture).

Lesson 3 | Predictability and Consistency

- Use DFA/DFM to design quality in.
- Conduct GRandRs to ensure reliable measurement systems are in place.
- Employ SPC to help ensure processes are predictable and stable.
- Reduce variation and improve process capability with DOE.
- Eliminate the root cause of defects using problem-solving and mistake-proofing.
- Move to Six Sigma quality.

Lesson 4 | Set-Up Reduction

- Apply SMED concepts.
- Separate external tasks (external to the process) from internal tasks.

Lesson 5 | TPM

- TPM versus PM
- Develop operator involvement in the equipment and begin predictive maintenance practices.

Lesson 6 | Visual Workplace

- Visual Workplace
- Use status display of performance for dashboard or balanced measures and COQ results.
- Visual controls, such as sensory alerts, indicate if something is out of place.
- Marking on the floor, kanbans, andons, and panel-alarms all help build a visual control infrastructure.

Lesson 7 | Support Processes

- Lean techniques require changes in Purchasing, Scheduling, Warehousing/Shipping, and Accounting practices.

Lesson 8 | Continuous Improvement

- Fight NIH (not-invented-here) attitudes and leverage successes.
- Use kaizen events for rapid, targeted improvements to achieve the future state.
- Use a standardized Problem-Solving Model (e.g. DMAIC or 8D).
- Begin an employee idea system.

Unit 2 Challenge

- An assessment of the learner’s progress in this unit.

UNIT 3 IMPLEMENTING LEAN

Lesson 1 | Lean Starts with People

- Lean Starts with People
- Communicate the why, what, how, and who.
- Provide education in the concepts.
- Train employees in tools and techniques as needed to achieve a flexible workforce.

Lesson 2 | Data Drives Lean

- Focus efforts on projects that lead to tangible savings.
Calculation techniques to generate data include: Time studies, equipment loading, TAKT time, staffing requirements, process yields, and COQ.

Sample Worksheets covered include: Lean Project Summary; Cell Target Worksheet; Data Collection Form for Basic Equipment and Utility Parameters; Value-Adding Analysis Worksheet; Process Change-Over/Setup Worksheet; Set-Up Reduction Worksheet; and Lot Size Worksheet.

Lesson 3 | Layout Options

Improved layouts are about moving cubic feet (not numbers of items), eliminating crossover points, arranging the process in the natural flow order; linking processes to minimize time and distance; moving equipment together to simulate a continuous process flow; and putting internal customers and suppliers next to each other.

Be careful to identify anchors or monuments; do not move them.

Typical layout options are explored.

Lesson 4 | Lean Inventory Practices

Minimize trips to and from the warehouse by designing the warehouse to work for you.

Use ABC inventory categories to prioritize inventory needs and storage locations.

Lesson 5 | Roadmap for Lean

Start with the people issues.

Focus on workplace organization (the 5S's), then, use value stream analysis and process workflow analysis to establish effective layouts.

Where to focus next depends on specific needs.

Use targeted Kaizen events to speed changes.

Do not overlook the need to modify support processes (especially scheduling and purchasing).

Lesson 6 | Lean Pitfalls

Not documenting the financial impact/savings.

Lack of commitment from leadership.

Using traditional purchasing practices.

Not changing scheduling techniques.

Failure to address workforce issues.

Not mistake-proofing the root cause.

Thinking Lean is just for manufacturing.

Not using beneficial technology.

Not leveraging successes.

Getting too lean.

Failure to hold the gains.

Unit 3 Challenge

An assessment of the learner's progress in this unit.