Black Belt Study Guide

Scott Bales Consulting Academy | Manufacturing-Focused Operational Excellence

Black Belt Certification Standard

Black Belt is the SB Academy operational excellence leadership certification. Candidates are expected to lead cross-functional manufacturing improvement, defend financial logic, coach Green Belts, and sustain results through governance and control systems.

Recommended project impact: $100,000 annualized financial benefit or a strategically significant improvement in quality, delivery, safety, capacity, working capital, or customer risk.

DMAIC Executive Roadmap

Phase	Black Belt expectation
Define	Connect the project to business strategy, VOC, CTQs, scope, sponsor expectations, and measurable business impact.
Measure	Build trustworthy baseline data, operational definitions, sampling plans, and measurement system confidence.
Analyze	Validate drivers with evidence, stratification, practical statistics, and cause verification.
Improve	Select countermeasures based on cause linkage, risk, cost, feasibility, stakeholder acceptance, and pilot learning.
Control	Sustain results with owners, metrics, triggers, reaction plans, audits, dashboards, and leadership reviews.

Core Acronyms

VOC - Voice of Customer. CTQ - Critical to Quality. SIPOC - Suppliers, Inputs, Process, Outputs, Customers. MSA - Measurement System Analysis. FMEA - Failure Modes and Effects Analysis. ROI - Return on Investment. COPQ - Cost of Poor Quality. OEE - Overall Equipment Effectiveness. SPC - Statistical Process Control. RACI - Responsible, Accountable, Consulted, Informed. VSM - Value Stream Map. KPI - Key Performance Indicator. NPV - Net Present Value. EBITDA - Earnings Before Interest, Taxes, Depreciation, and Amortization.

Financial Validation

Black Belts must separate hard savings, soft savings, cost avoidance, capacity creation, working capital effects, and risk reduction. Finance should review assumptions before savings are communicated as validated.

Common failure modes include double counting, annualizing short-term pilots too aggressively, claiming avoidance as hard savings, ignoring volume changes, and failing to subtract implementation cost.

Manufacturing Case Study

A plant loses capacity due to long changeovers, missing staged tooling, and inconsistent first-piece approval. The Black Belt uses SMED thinking, data collection, stratified changeover analysis, standard work, readiness checks, and financial validation to convert operational pain into a $148,000 annualized impact project.

Server 13 Readiness

Server 13 review should see the complete story: charter, VOC/CTQ, SIPOC, current-state map, data plan, baseline, MSA or measurement confidence, Pareto, validated causes, selected improvements, pilot evidence, financial logic, control plan, and executive storyboard.

Module 01: Black Belt Leadership, Certification Standard & Executive Expectations

Define the Black Belt role as a manufacturing transformation leader with financial accountability.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 02: Strategic Deployment & Project Portfolio Thinking

Connect projects to business strategy, operational priorities, and executive scorecards.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 03: Advanced Voice of the Customer and Stakeholder Requirements

Translate customer and stakeholder needs into measurable CTQs across value streams.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 04: CTQ Flowdown and Requirement Translation

Build traceability from customer need to process input, output, metric, and control.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 05: Project Portfolio Selection and Financial Prioritization

Select projects by ROI, risk, feasibility, strategic fit, urgency, and resource demand.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 06: Advanced Project Charter Development

Build executive-ready charters with scope, business case, risk, timeline, team, and governance.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 07: Advanced Process Mapping and Value Stream Thinking

Map flow, handoffs, queue time, information flow, and manufacturing constraints.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 08: Data Collection Systems and Baseline Integrity

Design data plans that produce trustworthy baselines and defendable savings.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 09: Measurement System Analysis for Black Belts

Evaluate measurement error, repeatability, reproducibility, agreement, and operational definitions.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 10: Statistics for Black Belts Without Academic Overload

Use practical statistics to make decisions, not to impress people with formulas.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 11: Hypothesis Testing and Practical Decision Making

Compare groups, validate differences, and avoid reacting to noise.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 12: Regression, Correlation and Relationship Analysis

Evaluate relationships between inputs and outputs without confusing correlation with cause.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 13: Advanced Pareto and Stratification

Expose hidden drivers by segmenting data by product, shift, machine, customer, and time.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 14: Advanced Root Cause Validation

Move from suspected causes to verified causes through evidence and disciplined testing.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 15: Cause and Effect Matrix

Prioritize process inputs based on their relationship to CTQs and business impact.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 16: Failure Modes and Effects Analysis

Use FMEA to prioritize risk, reduce failure exposure, and protect customers.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 17: Risk Management and Project Governance

Manage project risk, sponsor alignment, decision gates, and escalation.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 18: Change Management and Stakeholder Buy-In

Lead adoption through communication, involvement, resistance management, and accountability.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 19: Control Systems and Sustainment

Build controls that survive turnover, pressure, audits, and operational drift.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 20: Financial Validation and Benefit Tracking

Validate hard savings, soft savings, avoidance, working capital, and cost models.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 21: ROI, Cost Modeling and Executive Impact

Connect operational improvement to EBITDA, cash, capacity, quality, delivery, and growth.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 22: Project Storyboarding and Executive Communication

Tell the project story clearly with evidence, decisions, impact, and controls.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 23: Coaching Green Belts and Building Capability

Coach project leaders, review charters, challenge weak logic, and build internal capability.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.

Module 24: Server 13 Black Belt Project Validation

Prepare a complete Black Belt evidence package for rigorous validation.

Study focus: explain how this topic influences project selection, evidence quality, stakeholder alignment, financial validation, and sustainment.

Application: document one example from a manufacturing environment where this topic would change the project decision or control approach.