

LSSBB: Lean Six Sigma Black Belt

Lead complex improvement projects, coach Green Belts and turn statistics into business decisions.

DURATION

8 days · 64 hours

LEVEL

Advanced

CURRICULUM

22 modules · 13 labs

DELIVERY

Live online, Onsite,
Corporate

Course overview

Black Belts lead the improvement projects that are too complex, too cross-functional or too data-heavy for a Green Belt alone. They also coach others and help leaders choose which problems are worth solving. This eight-day course builds both the technical depth and the leadership habits the role demands.

The first half revisits DMAIC at Black Belt depth. You will work with larger datasets, assess measurement systems for continuous and attribute data, model capability for non-normal processes and choose the right hypothesis test with confidence. Multiple regression, logistic regression and nonparametric tests are introduced with practical interpretation rather than theory alone.

The second half focuses on designing and running experiments — full and fractional factorials, screening designs and response surface basics — followed by advanced control strategies, Lean flow and the people side of change. You will practise stakeholder influence, resistance handling, coaching conversations and deploying an improvement programme across an organisation.

A capstone project runs through the course with tollgate reviews at the end of each phase, giving you a complete storyboard to discuss with your sponsor.

This course is aligned to the body of knowledge common to Lean Six Sigma Black Belt certification. Certifying bodies differ in format and project requirements, so the exam option is confirmed with you at enrolment. Ace Skills does not guarantee a pass.

Highlights

- 64 hours of live, trainer-led sessions
- Advanced statistics, regression and DOE in depth
- Change leadership, coaching and programme deployment
- Multi-phase capstone project with tollgate reviews
- Practice questions with review

What's included

- Black Belt depth across the full DMAIC cycle
- Regression, nonparametric tests and DOE with real datasets
- Capstone project with tollgate reviews
- Change leadership and coaching practice
- Programme deployment and project selection methods
- Course completion certificate from Ace Skills Consulting
- Post-training support while you run your first Black Belt project

Who this course is for

Who should attend

- Certified or experienced Green Belts
- Continuous improvement and operational excellence leads
- Quality managers and engineers
- Transformation and programme managers
- Analysts who lead cross-functional improvement work

Prerequisites

- Green Belt knowledge or equivalent project experience
- Comfort with basic statistics and spreadsheets
- A laptop with Excel; Minitab recommended

Detailed curriculum — 8 days, 64 hours, 22 modules, 13 hands-on labs

Day 1 Black Belt Role and Enterprise Deployment

8 hours

1.1 Organisation-wide improvement

- Lean Six Sigma deployment models
- Linking projects to strategy
- Roles and governance
- Benefits tracking

1.2 Project selection

- Prioritisation matrices
- Project risk and readiness
- Balanced scorecards

LAB Prioritise a project portfolio · 45 min

1.3 Advanced Define

- Complex chartering
- VOC analysis with affinity and Kano
- Stakeholder and influence mapping

LAB Charter the capstone project · 45 min

Day 2 Advanced Measure

8 hours

2.1 Data collection strategy

- Sampling plans
- Rational subgrouping
- Operational definitions

2.2 Measurement systems

- Gauge R&R for continuous data
- Bias, linearity and stability
- Attribute agreement analysis

LAB Evaluate two measurement systems · 50 min

2.3 Capability

- Short- and long-term capability
- Capability for attribute data
- Non-normal data and transformations

LAB Capability analysis with non-normal data · 45 min

Day 3 Analyse I: Inference

8 hours

3.1 Probability and distributions

- Binomial, Poisson and normal
- Confidence intervals
- Central limit theorem

3.2 Hypothesis testing in depth

- Power and sample size
- Paired tests
- Proportion tests
- One- and two-sample tests
- Tests for variances

LAB Select and run the right test for six scenarios · 60 min

3.3 Nonparametric tests

- Mann-Whitney
- Mood's median
- Kruskal-Wallis

Day 4 Analyse II: Modelling

8 hours

4.1 ANOVA

- One-way and two-way ANOVA
- Checking assumptions
- Multiple comparisons

LAB Two-way ANOVA on service data · 45 min

4.2 Regression

- Multiple regression
- Model selection
- Logistic regression introduction
- Multicollinearity
- Residual diagnostics

LAB Build and validate a regression model · 55 min

4.3 Capstone tollgate

- Analyse-phase findings
- Presenting statistical results to sponsors

Day 5 Improve I: Designed Experiments

8 hours

5.1 DOE fundamentals

- Planning experiments
- Full factorial designs
- Randomisation, replication and blocking

5.2 Efficient designs

- Fractional factorials and resolution
- Centre points
- Screening designs

LAB Design and analyse a fractional factorial · 60 min

5.3 Optimisation

- Response surface introduction
- Confirmation runs
- Interpreting contour plots

Day 6 Improve II: Lean and Solution Design

8 hours

6.1 Lean flow

- Takt time and line balancing
- SMED
- Pull systems and kanban
- Theory of constraints

LAB Rebalance a process to takt time · 45 min

6.2 Solution design

- Creative techniques
- Design FMEA
- Pugh matrix
- Pilot design and evaluation

LAB Pugh matrix and pilot plan for the capstone · 45 min

Day 7 Control and Change Leadership

8 hours

7.1 Advanced control

- Control chart selection for varied data
- Control plans and audits
- EWMA and CUSUM introduction

LAB Design a control strategy · 45 min

7.2 Leading change

- Change models
- Communication planning
- Resistance and influence
- Team dynamics and facilitation

7.3 Coaching

- Coaching Green Belts
- Giving feedback on analysis
- Tollgate reviews

LAB Coaching role-play · 40 min

Day 8 Capstone and Exam Readiness

8 hours

8.1 Capstone presentations

- Full DMAIC storyboard
- Lessons learned
- Financial validation

LAB Present the capstone to a mock sponsor panel · 90 min

8.2 Exam readiness

- Body of knowledge review
- Calculation practice
- Practice questions with review

Skills and tools

Skills you will build

DMAIC leadership

Project portfolio selection

Measurement systems analysis

Non-normal capability

Hypothesis testing

Nonparametric tests

ANOVA

Multiple regression

Design of experiments

Lean flow

Statistical process control

Change management

Coaching

Tools used in class

Minitab

Microsoft Excel

DOE worksheets

Project storyboard template

Certification exam

This course is aligned to the exam below and prepares you for it. The exam itself is booked and taken with the vendor.

Exam Lean Six Sigma Black Belt certification exam

Exam code LSSBB

Exam skill areas covered

Deployment and project selection

Exam details are pending verification. Confirm the current exam code, format and fee on the official vendor page before booking.

Frequently asked questions

Which body certifies the Black Belt?

Certification is offered by several bodies with different exam formats and project requirements. We confirm the certifying body with you at enrolment.

Do I need a Green Belt first?

Most learners hold one or have equivalent project experience. If you do not, speak to an advisor about starting with our Green Belt course.

How heavy is the statistics?

Substantially deeper than Green Belt. Every method is practised in software, so you focus on choosing and interpreting tests rather than hand calculation.

Is Minitab required?

It is strongly recommended for DOE and regression. Excel alternatives are shown where practical.

Can the capstone use our own project?

Yes, for private batches we can build the capstone around a project from your organisation.

Book a batch or talk to an advisor

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