

Six Sigma Green & Black Belt 20-Day Programme (2005)

	CORE PRINCIPLES	DEFINE	MEASURE	
	Day 1: Six Sigma Overview	Day 2: Define Current Situation	Day 3: Data Collection & Analysis	Day 4: Process Capability
GREEN & BLACK BELT	Origin and background of six sigma Overview of DMAIC process People roles Six sigma results	Problem statement Process mapping Xs & Ys C & E matrix	Data collection <ul style="list-style-type: none"> • Variables & attributes • Sampling and stratification • Check sheets/tally chart/measles chart Bar chart Pareto Run chart / trend chart Histogram Basic statistics: mean, range, standard deviation	Normal distribution Capability indices (Cp; Cpk; Pp; Ppk) Rational sampling & sub grouping Multi-vari studies
	Six sigma projects: Selection and management			Initial project review: Participants are invited to present to the group, details of their project, e.g. description, progress to date, etc.
	MEASURE (cont.)	MEASURE / ANALYSE	ANALYSE / IMPROVE	CONTROL
	Day 5: Six Sigma Metrics	Day 6: Measurement Systems	Day 7: Root Cause Analysis	Day 8: Process Control (1)
GREEN & BLACK BELT	Statistical definition of six sigma Predicting process fallout DPMO, PPM & yield Z-score & six sigma benchmark Cost of poor quality (COPQ)	Measurement uncertainty Errors in a measurement system Basic measurement studies	Is / Is not Root cause analysis <ul style="list-style-type: none"> • Brainstorming • Paired comparisons • Scatter chart • Fishbone chart • 5 whys 	Average & range control chart Decision rules Common & special causes Individuals & moving range chart Control charts for attributes Multiple characteristics Control vs capability
	Measurement Systems Analysis <i>(continued next session)</i>	Introduction to hypothesis testing (Green Belt only.)	Process Control <i>(continued next session)</i>	

	CORE PRINCIPLES		DEFINE / MEASURE	ANALYSE
	Day 9: Team Skills	Day 10: Lean Thinking	Day 11: QFD / Probability & Statistics	Day 12: Hypothesis Testing
BLACK BELT ONLY	Selecting & leading a team Team skills Team roles & responsibilities Team building	Waste elimination Workplace organisation (5S) Just-in-time (JIT) Cells/flow lines/kanban Takt time/cycle time/lead time Quick changeover (SMED) Total productive maintenance (TPM)	Quality function deployment (QFD) Simple probability Binomial distribution Poisson distribution Other distributions	Testing for normality Central limit theorem Level of significance / p-value Confidence intervals z-test t-test chi-square test F-test Tests on a single parameter Tests on two parameters Tests on proportions Paired comparisons
	ANALYSE (cont)			ANALYSE / IMPROVE
	Day 13: Regression Analysis	Day 14: Analysis of Variance	Day 15: Design of Experiments (1)	Day 16: Design of Experiments (2)
BLACK BELT ONLY	Correlation Sums of squares Linear regression models Prediction Non-linear regression models	Simple experimental designs (Randomised block; latin square) Analysis of means	Intuitive experiments Design matrix Full factorial design Prediction of optimum Taguchi's robust design Loss function concept Off-line & on-line quality control Orthogonal arrays Signal to noise ratio Fractional factorial design	Designing and conducting an experiment Screening Experimental runs Analysis of results Selection of optimum Confirmation
	ANALYSE / IMPROVE (cont)	IMPROVE	CONTROL	
	Day 17: Design of Experiments (3)	Day 18: Process Planning	Day 19: Process Control (2)	Day 20 Six Sigma Project Session
BLACK BELT ONLY	Evolutionary operation (EVOP) Response surface methodology (RSM)	FMEA Control plan Mistake-proofing (poka-yoke) Design for six sigma (DFSS) <ul style="list-style-type: none"> Statistical tolerancing Design for manufacture & assembly (DFMA) Fault tree analysis (FTA) Reliability engineering 	Control charts for special situations Advanced methods for evaluating capability (<i>continued next session</i>)	Control charts for special situations Advanced methods for evaluating capability Project review: Participants are invited to present to the group, an update of their project, e.g. progress to date, etc.

Note. Participants, who are considering entering the programme at Day 9, should complete a Green Belt Evaluation Form; a bridging course may be appropriate prior to attendance at Black Belt level. Alternatively, the 15 Day Fast Track Black Belt programme may be more appropriate.