	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Roles and Responsibilities	Support projects that are led by Green Belts or Black Belts. Assist Green Belts and Black Belts in data collection and analysis and process mapping. Implement tools, techniques and practices to achieve cost reduction and quality improvement.	Form and facilitate Six Sigma teams and manage basic Six Sigma projects. Green Belts typically work on improvement projects part-time and assist Black Belts in data collection, data analysis and process mapping. Implement tools, techniques and practices to achieve cost reduction and quality improvement while extending the "reach" of Black Belts.	Define projects for Green Belts and Yellow Belts. Mentor and guide Green Belts and Yellow Belts in the completion of their projects. The Black Belt utilizes statistical analysis software to draw valid statistical conclusions, depict relationships, analyze measurement systems, test hypotheses, design experiments, apply statistical process control, and more. Black Belts manage more advanced Six Sigma projects, and serve as leaders and change agents for projects that span the enterprise.	Train, mentor and coach everyone in the organization who is involved in Six Sigma. Raise the level of organizational competency with respect to Six Sigma. Be the highest level of technical expertise regarding Six Sigma in the organization. Develop and conduct training sessions. Transfer lessons learned. Assist upper management to drive change. Lead large and complex projects. Foster an organizational culture of continuous improvement. .

	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Target audience – who should attend?	Junior level employees First line operators Administrators Potential Green Belt and/or Black Belt candidates Anyone who may support the planning and execution of process improvement projects If you plan to pursue the Green Belt certification, the Yellow Belt is not required nor is it recommended.	Project managers Team leaders Programmers/Systems analysts Team members who will participate in improvement projects Candidates seeking to continue for the Six Sigma Black Belt Certification	Outstanding individuals who have the aptitude and desire to master the complexities of the training program, based on their performance as Six Sigma Green Belts. Individuals who will lead organization-wide improvement efforts. Candidates seeking the Master Black Belt certification.	Outstanding individuals who have the aptitude and desire to master the complexities of the training program and fulfill the role of the Master Black Belt, based on their performance as Six Sigma Black Belts.
Certification requirements	Completion of a training course, including all exercises and assignments, and a grade of 80% or better on a written final examination.	Completion of a training course, including all exercises and assignments, and a grade of 80% or better on a written final examination.	Completion of a training course and a comprehensive project. NOTE: Students have the option of completing the training course but not a project and receiving documentation of completion.	Completion of a training course, including all exercises and assignments.
Course length - classroom	The Yellow Belt course is offered only in an online format at this time.	Five consecutive days; courses are regularly scheduled.	Blended Learning. Five consecutive days in the classroom followed by online course 2 of 2 which must be completed within one year of enrollment. Courses are regularly scheduled.	The Master Black Belt course is offered only in an online format at this time.
Course cost – classroom	N/A	$2295 US	$4495 US	N/A

Class size – classroom. Min. size based on non-discounted registrations.	N/A	5 minimum – 15 maximum	3 minimum – 10 maximum	N/A
	Yellow Belt	**Green Belt**	**Black Belt**	**Master Black Belt**
Course length - online	Course must be completed within three months of receipt of course materials and login id. Students may enroll and start at any time. Participation at least once each week is required. Students should plan on minimum of 14 hours of study time.	Course must be completed within four months of receipt of course materials and login id. Students may enroll and start at any time. Participation at least once each week is required. Students should plan on a minimum of 35 hours of study time.	Course must be completed within 12 months of receipt of course materials and login id. Students may enroll and start at any time. Weekly participation is required. Students should plan on a minimum of **70** hours of study time plus time to complete a project.	Course must be completed within six months of receipt of course materials and login id. Students may enroll and start at any time. Participation at least once each week is required. Students should plan on a minimum of 50 hours of study time.
Course cost - online	$950 US	$2295 US	$4495 US	$2295 US
Class size - online	Not applicable	Not applicable	Not applicable	Not applicable
Professional Development Units (PDU's)	14	35	70	50
Continuing Education Units (CEU's)	1.4	3.5	7.0	5.0
Required work to be done outside of the classroom	None	None	Completion of a project that demonstrates application of the Black belt body of knowledge is required if certification is desired.	No project, but significant assignment work is required outside of the classroom
Written examination	50 questions, 80% is passing	100 questions; 80% is passing	None	None
Text (included in the cost of the course)	*What Is Six Sigma* by Pande and Holpp, ISBN 0-07-138185-6	*Six Sigma Demystified – 2nd Edition* by Paul Keller ISBN 978-0-07-174679-3	*Implementing Six Sigma – Second Edition* by Forrest W. Breyfogle III, ISBN 0-471-26572-1	*Implementing Six Sigma – Second Edition* by Forrest W. Breyfogle III, ISBN 0-471-26572-1

	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Six Sigma Certification Prerequisites	None	None	Candidates must be previously certified as a Six Sigma Green Belt, or must complete the Key Performance Six Sigma Green Belt training program prior to enrolling. Candidates who are previously certified are required to show proof of certification from another valid training provider or proof of certification from an employer.	Candidates are required to show proof of certification as a Black Belt from another training provider or an employer. Candidates must be certified for at least six months and must provide proof of completion of at least two projects as a certified Black Belt prior to enrolling in the Master Black Belt program.
Prerequisite math skills	Candidates are expected to have the following basic high-school level math skills: • Basic algebra (solving simple equations, cross multiplication) • Powers, roots • Interpolation • Equation for a line (slope and y intercept) • Proportions, percentages • Area under a curve			
Prerequisite language skills	Courses are taught in either the English language or, in some specific cases, the Spanish language. All online students must be able to read and write proficiently in English (for English language courses) or Spanish (for Spanish language courses). In addition, all classroom students must be able to speak proficiently in English (for English language courses) or Spanish (for Spanish language courses). We are not able to make special allowances for students who are not proficient in the language that the course is being taught in.			

	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Statistical Software **Note:** Refer to the Minitab website (www.minitab.com) for the current system requirements for Minitab and Minitab Quality Companion.	None	None	Current versions of Minitab and Minitab Quality Companion. Upon registration in the course, you will be provided with instructions on how to purchase a 12-month license for these two software products at a discount through FAU. NOTE: Minitab products are NOT available for the Apple Macintosh Operating System. These products may be run on a Macintosh only by using the Windows Operating System. NOTE: If you already have a trial version of either product, you will need to remove it before loading the licensed version.	Current version of Minitab. Upon registration in the course, you will be provided with instructions on how to purchase a 12-month license for Minitab at a discount through FAU. NOTE: As an alternative, it is possible for Master Black belt students to use the 30-day free trial version of Minitab to complete the Minitab-related assignments. NOTE: Minitab products are NOT available for the Apple Macintosh Operating System. These products may be run on a Macintosh only by using the Windows Operating System. NOTE: If you already have a trial version of Minitab, you will need to remove it before loading the licensed version.

	Yellow Belt	**Green Belt**	**Black Belt**	**Master Black Belt**
Computer requirements - classroom	None	None, but students will find a laptop with Microsoft Office to be useful during class if one is available.	Laptop computer with Microsoft Office. Visio optional.	Not applicable
Computer requirements - online	Personal computer with internet access and Microsoft Office required. Visio optional.	Personal computer with internet access and Microsoft Office required. Visio optional.	Personal computer with internet access and Microsoft Office required. Visio optional.	Personal computer with internet access and Microsoft Office required. Visio optional.

Frequently Asked Questions (FAQ's)

Q - What is Six Sigma?

A – Sigma is the Greek letter used by statisticians to identify a measure of variability. Six Sigma is the rigorous, structured and highly effective implementation of proven quality principles, tools and techniques. Six Sigma is accomplished by planning and executing projects that align resources with strategically important projects to bring tangible results to the bottom line. Six Sigma professionals use a well-defined problem-solving model to improve the performance of processes to a virtually error-free level that results in increased customer satisfaction, higher quality and lower costs. The tools and techniques of Six Sigma are integrated into an intensive training regimen that focuses on practical application and measurable results.

Q - Why should I choose Florida Atlantic University (FAU) and Key Performance LLC for my Six Sigma Certification Training?

A - Six Sigma is implemented by planning and executing projects. Key Performance LLC is first and foremost a project management training organization, and you will learn from highly qualified instructors who are Project Management Professionals (PMP's) as well as Six Sigma Master Black Belts. Our programs offer open enrollment, are available to individuals who are not currently employed in an organization that is involved with Six Sigma, and feature small class sizes. All of our programs are available in both a traditional classroom format, and online using the BlackBoard course delivery system. Our programs focus on real-world application as opposed to mathematical and statistical theory.

If you are already certified as a Project Management Professional (PMP) by the Project Management Institute (PMI), or hold one of the other PMI certifications, you will earn Professional Development Units (PDU's) for our courses. Key Performance is a Registered Education Provider (REP) with PMI and our Six Sigma courses have been approved for PDU's. In addition, you will receive Continuing Education Units (CEU's) from FAU.

Finally, your Six Sigma Certification is granted jointly by FAU and Key Performance, so it carries the full weight of both organizations.

Q - How will Six Sigma help me to manage projects better?

A - The skills and knowledge that you gain will help you to do a better job of defining customer needs in measurable terms, linking your projects to business strategy, quantifying the bottom-line benefits of your project, and sustaining the gains after your project is turned over to ongoing operations. You will improve your ability to make decisions using facts and data, solve problems, and think in terms what adds value to business processes.

Q - How was the curriculum for each course developed?

A – Our curriculum was developed after a great deal of thought and study, and is based on a benchmarking study conducted by Key Performance LLC of a number of leading programs worldwide. Our curriculum is aligned with the recommendations of both the American Society for Quality (ASQ) and the International Society of Six Sigma Professionals (ISSSP), and seamlessly integrates Six Sigma, Project Management, and Lean Enterprise improvement methodologies. Our curriculum focuses on service and information systems/information technology business processes as well as manufacturing processes, and examples from both types of businesses are included. The Project Management portions of our curriculum are aligned with *A Guide to the Project Management Body of Knowledge (PMBOK Guide) Fourth Edition* as published by the Project Management Institute. The curriculum stresses the connection between project management and Six Sigma, and how project managers can and will be more successful when using the Six Sigma approach and Six Sigma tools and techniques.

Q – What is the difference between lean and Six Sigma?

A - Lean is an improvement methodology that focuses on identifying and eliminating waste. The tools and techniques in lean focus primarily on improving the flow of a process. Six Sigma is an improvement methodology that focuses on reducing variation in the output of a process, making the output more of what the customer wants and thus reducing the number of defects.

Lean is a term that was coined in a book that was written in 1990 about the automotive industry called *The Machine That Changed the World*. Lean is in fact the Toyota Production System (TPS), development of which began at the end of World War II. Not much was widely known about the TPS in this country until the late 1980's. Six Sigma was developed at Motorola and became widely became known in the 1980's. Both lean and Six Sigma are problem solving approaches and both share many common problem solving tools. None of the tools used are really unique to either methodology.

Our programs incorporate a blend of Six Sigma and lean. They include virtually all of the topics that are recommended by the American Society of Quality and the International Society of Six Sigma professionals for Six Sigma certification, as well as numerous lean topics. Our students have the option of Six Sigma or Lean Six Sigma on their certificates and students overwhelmingly choose Lean Six Sigma.

Q – How do lean and Six Sigma compare to business process improvement in general?

A - Business Process Improvement is a very broad umbrella. Any systematic approach to helping an organization achieve better results by changing its processes could be considered Business Process Improvement. Lean and Six Sigma are two such structured approaches.

All business process improvement methodologies have common characteristics such as selecting appropriate metrics, mapping the current state of the process, collecting facts and data about what factors influence the output of the process, analyzing the data to find the root cause of problems, selecting an improvement solution that addresses the root cause, and putting controls in place to sustain the gains.

Industry Week did a study of 3,000 or so companies several years ago and found that it was not terribly important which improvement methodology was used, as long as an organization picked one and stuck with it. The top two choices were lean and Six Sigma. An analogy is exercise. It is not so important which method you use (running, swimming, walking, biking) but rather that you pick one or more of them and do them regularly.

Q – Isn't Six Sigma just for manufacturing operations?

A – No. Six Sigma is used in all types of service oriented and transactional process environments as well as in manufacturing. Our courses include examples and exercises that address service and information technology related processes as well as manufacturing processes.

Q - What's in it for me to get certified?

A – Six Sigma certification is a widely recognized and highly prized credential in the marketplace. In addition, you can expect to be more successful in your current position by achieving better results personally, and by calling attention to ways in which your organization can improve in a broader sense. The knowledge that you gain will increase your expert power in any organization and make you a more valuable employee. Individuals choose to pursue Six Sigma Certification for the following reasons:

- Career advancement
- Personal growth
- Increased self-esteem and confidence
- Increased level of job performance
- Improved marketability

Q – Why should my organization support Six Sigma certification?

A - Organizations will realize the following benefits from having their employees Six Sigma certified:

- Implementation of an improvement framework with proven tools
- Improvement of your most important asset, your employees
- Achievement of organizational excellence in business process improvement

- Excellent Return on Investment – 10 to one or greater return on your training dollars

Q - What if I am not part of an organization that currently uses Six Sigma?

A – You are welcome to enter our open enrollment courses. In the case of the Black Belt certification, we will make sure that you have an opportunity to work on a project that will allow you to demonstrate your skills and earn your certificate. Individuals who are not currently employed may complete a project for a charity, a house of worship, an agency in their community such as a youth sports league, or any number of other opportunities.

Q – How are the online courses delivered?

A - You will have full access to the course content for the scheduled duration of each course. You can study at your own pace and on your own schedule as long as you are making regular, weekly progress toward completing the course within the allowed time frame. Your instructor is available on an ongoing basis for guidance, discussions and to give you feedback on your course work throughout the duration of the course. The textbook for the course will be mailed to you before the start date of the course.

Our online courses feature the exact same content, rigor and instructors as our classroom courses, and are designed for individuals who are motivated to pursue Six Sigma certification but unable to attend a traditional classroom training course.

Q – What happens if I don't complete an online course within the required time frame?

A – Your tuition will be forfeited if an online course is not completed within the allowed time frame, unless prior arrangements are made with the course instructor. Students are required to remain active on a regular weekly basis, either by posting in the BlackBoard system or by communicating with the course instructor in some other fashion. If tuition is forfeited and you wish to re-enroll for the course, you will be charged the full amount less the cost of the textbook(s).

Q – Do you offer group discounts or any other type of discount?

A – Yes. A group discount of 10% is offered for three or more individuals from the same organization registered for the same course. Also, if you have taken the Green Belt Certification course from FAU and Key Performance you will receive a 10% discount on the Black Belt and/or Master Black Belt courses.

If you are unemployed and live in Broward County FL or Palm Beach County FL you may be eligible for government tuition assistance up to $6000 to attend approved training courses. Please contact Todd Edge at Florida Atlantic University, 561-297-2544 for more information.

Q – May I take the Black Belt training course but not complete a project?

A – Yes, however at the end of the course you will receive evidence of completion of the training course, but you will not be certified as a Black Belt. It would be possible for you to become certified at a later date by satisfactorily completing a project.

Q – May I complete my Black Belt project as part of a team?

A – No, you may not. The project is intended for you to demonstrate as an individual your ability to apply the tools and techniques of Six Sigma to a real world problem.

Q - How can I get more information?

A – Please contact Todd Edge at Florida Atlantic University (561-297-2544, tedge@fau.edu).

Q - What topics are included in each course?

A – Please refer to the following list of topics for our Six Sigma courses.

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NOTE: The numbers in each column correspond to the lesson numbers where the topic is found. The Black Belt program has two class sessions, so the number in the Black belt column is Session Number-Lesson Number. For example, 1-13 denotes Session 1, Lesson 13.

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Introduction	What is Six Sigma?	2	2		
	StatStuff Video 1-2 Introduction to Lean and Six Sigma		2		
	Themes of Six Sigma: 　1. Focus on the customer 　2. Data and fact driven management 　3. Process focus 　4. Proactive management 　5. Inter-department collaboration 　6. Drive for perfection; tolerate failure	3			
	On-ramps to implementing Six Sigma 　1. Business transformation 　2. Strategic improvement 　3. Problem solving	4			
	Case studies in Six Sigma implementation	8	14,17,24,28,20		
	DMAIC framework	5	2		
	StatStuff Video 3-5 The DMAIC Roadmap (Levels I and II)		2		
	Scientific Method		2		
	Y = f(X)		3		
	Benefits and impact of Six Sigma		4		
	MINITAB Software Introduction			1-1	
	MINITAB Quality Companion Software (MQC) Intro			1-1	
	MQC – Create Project File			2-5	
	Origins of Continuous Improvement Tools			1-3	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Design for Six Sigma	DFSS framework – DMADV; IDOV		2		1
	Alternative DFSS Frameworks – DMEDI, DMADOV, DCCDI				1
	Design for Manufacturing and Assembly (DFMA)				3
	Taguchi loss function				4
	Robust design and tolerance analysis – the Taguchi approach (P-diagram, ideal function, quality loss function, signal-to-noise ratio, orthogonal arrays)				5
	Static and dynamic Taguchi designed experiments using MINITAB				5
Phase	**Topic**	**Yellow Belt**	**Green Belt**	**Black Belt**	**Master Black Belt**
DMAIC Define Phase D1 – Select a Problem to be Solved

NOTE: Measures such as DPMO, Sigma level and rolled throughput yield may be know in the Define phase, or they may need to be determined in the Measure Phase of DMAIC | Project selection criteria | 5 | 10 | 2-1 | 7,8 |
	DPMO		4		
	Sigma level	3	4		
	Rolled throughput yield (RTY)		17		
	Introduction to Theory of Constraints		8	2-2	
	Black Belt Project Requirements			1-2	
	Program And Portfolio Management			2-3	
	SWOT Analysis			2-3	
	Benchmarking			2-4	
	Project Prioritization Matrix Using MQC			2-5	
	Infrastructure – Roles and Responsibilities	4	9	2-5	
	Project Charter and Stakeholder Analysis	5,7	11	2-5 using MQC	
	Cost of (Poor) Quality		4	2-5 using MQC Project Financial Analysis	
	Tracking Project Y Variables using MQC Data Store			2-5	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Statistical Process Control	Common cause and special cause variation		6	1-5	
	Process control v. process capability		7		
	Central Limit Theorem		15	1-4	
	Overview of SPC			1-5	
	Rational sampling and rational subgrouping			1-5	
	Selecting process variables and control charts			1-5	
	Creating Xbar and R control charts using MINITAB			1-7	
	Creating Xbar and S control charts using MINITAB			1-7	
	Creating Xmr (aka I-MR) control charts using MINITAB 15			1-7	
	Creating p control charts using MINITAB			1-7	
	Creating np control charts using MINITAB			1-7	
	Creating c control charts using MINITAB			1-7	
	Creating u control charts using MINITAB			1-7	
	Analyzing Control Charts			1-6	
	Precontrol			1-8	
	Short run control charts				20
	Cusum control charts				20
	Zone control charts				20
	EWMA control charts				20
	I-M/R-RS control charts				20

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Define Phase D2 – Develop a Project Plan	Elements of a Project Plan	7	12		
	Bar Chart (Gantt chart) using MQC			2-6	
	Project Risk Assessment using MQC			2-6	
	Meeting Minutes using MQC			2-6	
	Task Progress Report using MQC			2-6	
	Schedule Evaluation Worksheet using MQC			2-6	

DMAIC Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
	DMAIC Team Life Cycle	5			
Teamwork and Change Management	Team formation	5,6			
	Being asked to join a Six Sigma team	6			
	Attending Six Sigma training	5,6			
	Finding a DMAI team working on your process	6			
	Being asked to gather data	6			
	Being asked to help implement a process solution	6			
	Benefits of being part of a Six Sigma team	6			
	Leadership for Six Sigma (optional module for participants who expect to fulfill a leadership role)	9			
	How to thrive as a Six Sigma Team member (optional module for those who expect to fulfill a team member role)	10			
	Tuckman model of team performance		12		
	Teams and Team Performance – teamwork, conflict resolution, project kickoff meeting			2-7	
	Sources of Power and Authority (French and Raven)			2-5	
	Acting as a Change Agent; Change and Transition			2-8	
	Employee empowerment				9
	Reducing resistance to change				11
	Generating buy-in for change				11
	Seven myths that undermine effective change				11
	Coaching practices				16
	Performance planning, performance reviews, job descriptions				16

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Define Phase D3 – Document the Process and Voice of the Customer	Segmenting customers		14		
	Customer surveys		14		
	Customer focus groups		14		
	Other sources of customer information	7	14		
	Kano model		14		
	Departmental v. business process focus		13		
	Process flow analysis	7			
	Value added analysis	7			
	SIPOC diagram	7	13	2-9 using MQC	
	Cross-functional process map	7	13	2-9 using MQC	
	Value stream mapping		13	2-9 using MQC	
Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Define Phase D4 – Describe Process and Customer Requirements as Critical to Quality Characteristics (CTQ's)	CTQ's		5		
	Tree diagrams	7			
	CT Tree using MQC			2-10	
	Measurement Assessment Tree			2-10	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Foundational Statistical Concepts	Discrete v. continuous data		15		
	Basic concepts on probability		18		
	Introduction to probability distributions		18	1-10	
	PDF, CDF, Inverse CDF, degrees of freedom			1-10	
	Normal probability distribution			1-10	
	Binomial probability distribution			1-10	
	Poisson probability distribution			1-10	
	Hypergeometric probability distribution			1-10	
	Exponential probability distribution			1-10	
	Ch-Square probability distribution			1-10	
	Student's t probability distribution			1-10	
	F probability distribution			1-10	
	Other probability distributions			1-10	
	Probability plots		18-Using graph paper	1-13 using MINITAB	
	Inferential statistics and confidence intervals		15 - intro	1-11	
	Introduction to hypothesis testing		15	1-12	
	Hypothesis testing and confidence intervals using MINITAB – 1 sample Z, 1 sample t, 1 proportion, 1 sample Poisson rate, 1 variance, 2 ample t, Paired t, 2 proportions, 2 sample Poisson rate, 2 variances, ANOM, One-way ANOVA, Chi-squared, Test for Equal variances			1-14	
	Response surface methodology using MINITAB				17
	Non-normal data transformations using MINITAB			1-17	18
Phase	**Topic**	**Yellow Belt**	**Green Belt**	**Black Belt**	**Master Black Belt**
DMAIC Measure Phase M1 – Define What to Measure Based on CTQ's	Balanced Scorecard	7			
	Tracking Project X Variables Using MQC Data Store			2-5	
	The 1.5 Sigma Mean Shift			1-9	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Measure Phase M2 – Validate the Measurement System	Measurement terminology - accuracy, repeatability, reproducibility, stability, linearity		15	1-15	
	Measurement scales – ratio, interval, binary, ordinal, nominal		15		
	Measurement systems analysis	7	15	1-15	
	Gage linearity and bias study			1-16 Using Minitab	
	Gage R&R Study (Crossed)			1-16 Using Minitab	
	Gage R&R Study (nested)			1-16 Using Minitab	
	Attribute Agreement Analysis			1-16 Using Minitab	
Phase	**Topic**	**Yellow Belt**	**Green Belt**	**Black Belt**	**Master Black Belt**
DMAIC Measure Phase M3 – Develop a Sampling Plan and Collect Data	Hawthorne effect		16		
	Using new or existing data		16		
	Check sheet for data collection	7	16		
	Pictograph for data collection		16		
	Determining sample size			1-18	
	Calculating power and sample size using MINITAB 15			1-18	
	Operational definitions	7		1-13	
	Random sampling	7		1-19	
	Stratified sampling	7	16	1-19	
	Data collection plan using MQC			2-11	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Measure Phase M4 – Establish Baseline Performance	Process capability studies – Cp and Cpk; Pp and Ppk		7	1-20 using MINITAB	
	Process capability for attribute, non-normal, Binomial, and Poisson data			1-20	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Analyze Phase A1 – Describe the Data – Average and Variation	Descriptive statistics – Mean, median, mode, standard deviation, range, variance, skewness, kurtosis, standard error of mean		18 – using Excel	1-21 using MINITAB	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Analyze Phase A2 – Explore the Data for Potential Root Causes	Individual value plot			1-22 using MINITAB	
	Histogram	7	19	1-22 using MINITAB	
	Pareto chart	7	20	1-22 using MINITAB	
	Run chart	7	21	1-22 using MINITAB	
	Box plot		18	1-22 using MINITAB	
	Stem-and-leaf plot			1-22 using MINITAB	
	Dotplot			1-22 using MINITAB	
	Marginal plots – with histograms, with boxplots, with dotplots			1-22 using MINITAB	
	Multiple graphs on a layout using MINITAB			1-23	
	Report Pad in MINITAB			1-23	
	Analysis Capture Tool in MQC			2-13	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Analyze Phase A3 – Generate and Validate Hypotheses About the Root Causes	Cause and effect diagram	7	22	2-12	
	Five whys		22		
	Interrelationship diagram		22		
	Cause and effect matrix using MQC			2-12	
Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Analyze Phase A4 – Prove or Disprove Root Cause(s) of Defects	Scatter diagram (scatterplot)	7	24 – using Excel	1-24 using MINITAB	
	Matrix plot (array of scatterplots)			1-24 using MINITAB	
	Linear correlation		24 – using Excel	1-25 using MINITAB	
	Linear regression (simple and multiple)		24 – using Excel	1-25 using MINITAB	
	Fitted Line Plot			1-25 using MINITAB	
	One-Way ANOVA			1-25 using MINITAB	
	General Linear Model			1-25 using MINITAB	
	Binary logistic regression			1-25 using MINITAB	
	Ordinal logistic regression			1-25 using MINITAB	
	Nominal logistic regression			1-25 using MINITAB	

Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
Introduction to Design of Experiments (DOE)	Why use DOE?		24	1-27	
	Variation and its impact on quality			1-27	
	Terminology and Issues in DOE			1-26	
	Organizing and conducting a Designed Experiment			1-28	
	A Simple Experimental Design and Analysis using Graphical Techniques			1-29	
	A Simple Experimental Design and Analysis using MINITAB			1-30	
	Choosing an Experimental Design			1-31	
	Latin Square and Mixture Designs			1-32	
	Taguchi Methods			1-33	
	DOE Planning Worksheet in MQC			2-14	
	DOE Analysis Using MINITAB			1-34	
Phase	**Topic**	**Yellow Belt**	**Green Belt**	**Black Belt**	**Master Black Belt**
Alternatives to Classical DOE – Shainin/Bhote Techniques	Multi-vari analysis			S-1	
	Concentration chart			S-2	
	Components search			S-3	
	Paired comparisons			S-4	
	Product/process search			S-5	
	Variables search			S-6	
	B vs. C			S-7	
	Scatter plots to establish tolerances			S-8	
	Other Shainin-Bhote techniques			S-9	
Phase	**Topic**	**Yellow Belt**	**Green Belt**	**Black Belt**	**Master Black Belt**
Advanced Topics in DOE	Plackett – Burman screening designs using MINITAB 15				19
	Taguchi screening designs using MINITAB				19

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Phase	Topic	Yellow Belt	Green Belt	Black Belt	Master Black Belt
DMAIC Improve Phase I1 – Develop Alternative Solutions to Remove the Root Causes	Brainstorming	7	25		
	Multi-voting	7	25		
	Nominal group technique		25		
	Seven types of waste		23		
Lean Thinking	Overview of Lean Thinking		8	2-15	
	Lean Thinking – Toyota Production System Principles; Five Principles of Lean Thinking			2-15	
	The Perfect Business Process		23	2-16	
	Source inspection and mistake proofing		27	2-17	
	Workplace Organization		8	2-18	
	Visual and Audio Management			2-19	
	Pull systems		8	2-20	
	Total Productive Maintenance			2-21	
	Policy deployment				21
	Leaders who teach others				22
	Making decisions slowly by consensus; the A3 report				23
	Takt time and requirements for creating flow		8		24
	Facility and workplace layout principles, flow analysis, types of layouts, cell design principles				25
	Spaghetti chart		23		
	Office layout guidelines				25
	Level scheduling				26
	Improving the supply chain				27
	Lean transportation and logistics strategies				27

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DMAIC Improve Phase I2 – Synthesize Alternative Solutions	Affinity diagram	7	26		
	Simplified Quality Function Deployment (QFD)		26		
	Full Quality Function Deployment using freeware software template				2
	Failure Modes and Effects Analysis (FMEA)	7	26 – using Excel	2-22 using MQC	
	Idea Map in MQC			2-22	
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DMAIC Improve Phase I3 – Select the Best Solution	Impact/effort matrix		28		
	Scoring matrix		28		
	Process simulation			2-24	
	Pugh decision matrix			2-24	
	PDPC Chart		12	2-23	
	Force field analysis	7		2-25	
	Pairwise ranking			2-26	
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DMAIC Improve Phase I4 – Test and Implement the Solution	Solution implementation checklist in MQC			2-27	
	Project plan for implementation of process changes		28	2-27	
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DMAIC Control Phase C1 – Document the Improved Process and Ensure Stable Results	Standard Work Instructions (Visual Work Instructions) – Process Documentation	7	29	2-28	

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DMAIC Control Phase C2 – Develop a Process Management Plan	Process Control and Management Plan	5	30	2-29 using MQC	
	Automotive Industry Action Group (AIAG) Control Plan			2-29	
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DMAIC Control Phase C3 – Ensure Stable Results	Kaizen – Continuous Improvement			2-30	
	Leading a Kaizen event				10
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DMAIC Control Phase C4 – Close the Project	Project Turnover Meeting			2-29	
	Project Closure Report Using MQC			2-29	
	Post-Project Review			2-29	
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Training for Six Sigma	Best and worst training practices				12
	Adult learning theory				13
	Accelerated learning theory				14
	Principles of instructional design				15