Certification Paths and Process

Lean Six Sigma Green Belt Certification

- **For employees:** Implementation of a company-specific Business-Project
- **For students:** Implementation of a predefined Standard-Project

Comparison of Six Sigma Green Belt Certificates and Certification

Wikipedia: “Criteria for Green Belt and Black Belt certification vary; some companies simply require participation in a course and a Six Sigma project. There is no standard certification body, and different certification services are offered by various quality associations and other providers against a fee.”

TUM Lean Six Sigma Green Belt Certification	Requirements			Online Support		Target Group
	Theory Exam	Work Experience	Certification Project [2]	Group Lectures	Individual Coaching	
edX / TUM	TUM Lean Six Sigma Yellow Belt Certification [1]	no	Standard-Project Topic: environmental littering - reviewed by MBB	yes	no	Students & Employees without management support
TUM / edX			Business-Project Topic: company specific - reviewed by MBB, - steered by company sponsor	optional	yes	Employees with management support
American Society for Quality ASQ	ASQ Green Belt Body of Knowledge online test	3 years, full time, involved in CIP, under supervision of a BB	no	no	no	Employees

1) Includes ASQ Green Belt Body of Knowledge

2) Recommended by the International Society of Six Sigma Professionals (ISSSP)

International Society of Six Sigma Professionals (ISSSP): “Students with Green Belt or Black Belt training, who have not yet completed a live project, should receive a Six Sigma certificate. Once he/she completes a live project, the individual would be considered certified.”

Our TUM Green Belt certification requires our TUM Six Sigma Yellow Belt Certificate …

TUM Six Sigma Yellow Belt (via edX QPLS1x-3x)

TUM Lean Six Sigma Green Belt Course (via TUM)

Business-Project

- **Company specific topic**
  - Define, measure, analyse, improve and control a selected process and output in your company
- **Implemented individually**
- **Supported by individual MBB coaching**
- **Review and feedback for each DMAIC phase**
- **Steered by company sponsor**

TUM Lean Six Sigma Green Belt Course (via edX QPLS4x)

Standard-Project

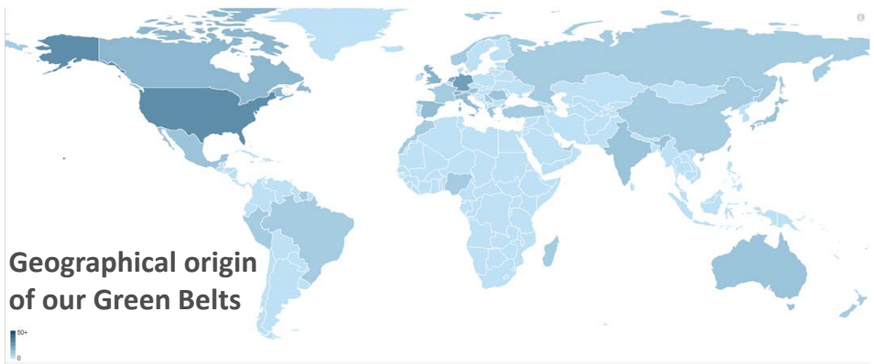
- **Predefined topic**
  - Define, measure, analyse, reduce and control environmental littering in public places of your city
- **Implemented individually**
- **Supported by weekly MBB online lectures**
- **Review and feedback for each DMAIC phase**

TUM Lean Six Sigma **Green Belt Certification**

… and the implementation of a company-specific Business-Project or our predefined Standard-Project

Our worldwide Business-Projects show a variety of company specific problems …

Agriculture:	Optimise sowing and harvesting cycles in a tulip farm
	Reduce broken olives for Queen Variety
	Rubber losses during harvesting
Chemistry/ Pharmacy:	Optimize pump maintenance intervals
	Reduce effort/ errors in recipe-specific drug production
	Reduce the variation of the colours of car coatings
Construction:	Accelerate service contracts to establish department stores
	Quality defects and delays in delivery of precast concrete parts
Data Processing :	Abandonment rate in online payment process
	Errors in translation and legal information of multilingual webpages
	Improve on-boarding of applications for specific business needs
	Increase permission rate/ channels for customer contact
	Optimize bonus distribution for customer types
	Reduce accounting errors in the commissions of sales employees
	Reduce contact frequency of frequent callers in hotline
	Reduce fraud rate on game & video downloads/ on prepaid contracts
	Reduce waiting times in hotline queue
Finance:	Cycle times and compliance with rules for credit decisions



Manufacturing:	Bristle losses in street cleaning machines
	Contact faults in wiring harnesses for cars
	Decreasing performance of condensate removal pumps
	Delayed drawing creation for chimney pipes
	Errors and high expenditure of time with storage of supplied parts
	High reject rate of gravity die cast pistons
	Improve maintenance orders for helicopters
	Incident management errors and delays for automotive parts
	Increase reusability of masks in semiconductor manufacturing
	Increase start-up speed in paper production
	Length deviations for aluminium rods
	Material losses during vulcanization of tyres
	Pinholes in blister packages
	Reduce pinholes in powder coating of steel profiles
	Reduce scrap rate for injection moulded parts
	Reducing waste of cutting insulating blankets for aircrafts
	Scratches and mounting errors on bicycles
	Sterilization of medical products
Mining/ Oil/ Gas:	Improve filling of LPG cylinders
	Problems resulting from drawing standards of deep sea supply units
	Reduce errors in welding seams
	Scope of component maintenance of oil platforms
Retail:	Secure increasing order volume with constant resources of car sales
Technical Service:	Increase OLED lifetime
	Resource optimization in prototype development

Our participants originate from more than 35 countries

… and illustrate the application range of Six Sigma

Our <u>Standard-Project</u> follows the United Nations Sustainable Development Goal 11:

11 MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

Human settlements

… Urban planning, transport systems, water, sanitation, **waste management**, … are all relevant issues to sustainable urban development.
…

Local and regional governments have a wealth of valuable experience in the **"localization" of the 2030 Agenda**, where they **provide leadership in the mobilization** of a wide range of stakeholders, the **facilitation of "bottom-up" and inclusive processes**, and the **formation of multi-stakeholder partnerships.**

United Nations: https://sdgs.un.org/goals/goal11

< Make cities and human settlements inclusive, safe, resilient and sustainable >

Our way to your Lean Six Sigma Green-Belt Certification …

Certification Process		Introduction	DEFINE (part 1 & 2)	DEFINE (part 3)	MEASURE	ANALYSE	IMPROVE	CONTROL
Course Content	**all Projects ▶**	Videos, Course Book, Handouts	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book	Videos, Course Book, Handouts, sigmaGuide, Project-Story-Book
		1 Certification Process 2 Course Introduction 3 Six Sigma Introduction: Overview 4 Six Sigma Introduction: Improvement Program 5 Six Sigma Example: Cookie du Chef 6 Six Sigma Introduction: DMAIC 7 Six Sigma Introduction: Process-Problem-Solving-Model 8 Six Sigma Introduction: Problem-Solving-Principles 9 Six Sigma Introduction: Statistical-Basis 10 Six Sigma Introduction: Linking Reality, Model, and Statistics	11 sigmaGuide 12 DEFINE Overview 13 DEFINE Project-Topic 14 DEFINE Project-Definition 15 Project-Story-Book	16 DEFINE SIPOC 17 DEFINE Voice-to-Critical 18 DEFINE Project-Charter 19 DEFINE Stakeholder-Communication	20 MEASURE Overview 21 MEASURE Input-Analysis 22 MEASURE Process-Mapping-Analysis 23 MEASURE C&E-Matrix 24 MEASURE Data-Collection-Plan 25 MEASURE Hypotheses	26 ANALYSE Overview 27 ANALYSE Data-Evaluation 28 ANALYSE Process-Performance 29 ANALYSE Hypotheses-Tests 30 ANALYSE Root-Cause-Analysis - Preparation 31 ANALYSE Root-Cause-Analysis - Implementation	32 IMPROVE Overview 33 IMPROVE Development and Selection of Solutions 34 IMPROVE Measures, Risks (FMEA) and Implementation	35 CONTROL Overview 36 CONTROL Data Evaluation 37 CONTROL Process-Performance 38 CONTROL Improvement-Verification and Benefits 39 CONTROL Process-Management-Plan 40 CONTROL Project-Completion 41 Six Sigma Project-Guideline **Addendum** 42 Lean and Six-Sigma - Roots and Development 43 Lean vs Six-Sigma - Comparison of Characteristics
Tasks & Requirements	**all Projects ▶**	**- TUM Lean Six Sigma Yellow Belt Certificate**	- Project tasks - sigmaGuide: Application of related tools - Results edited in Project-Story-Book (D----)	- Project tasks - sigmaGuide: Application of related tools - Interviews with: process owner (VoB) and customer (VoC) - Results edited in Project-Story-Book (D----)	- Project tasks - sigmaGuide: Application of related tools - Workshop I: Process-Mapping & -Analysis - Statistics: Worksheet with collected data - Results edited in Project-Story-Book (DM---)	- Project tasks - sigmaGuide: Application of related tools - Workshop II: Root-Cause-Analysis & Solutions - Statistics: Data Inspections and Analyses - Results edited in Project-Story-Book (DMA--)	- Project tasks - sigmaGuide: Application of related tools - Implementation of measures - Results edited in Project-Story-Book (DMAI-)	- Project tasks - sigmaGuide: Application of related tools - Statistics: - Process-Capability & Control-Charts; - Verification of benefits - Results edited in Project-Story-Book (DMAIC)
Group Online Lectures	**Standard-Project ▶** **optional for Business-Project ▶**	**<u>Weekly</u> repeated series with 10 online lectures for the Standard-Project to:**	- Introduction of methods, tools, and tasks along the DMAIC phases - Participants present chapters of their Project-Story-Book - Discussion about transfer to own working environment		**Participation in all 10 lectures of the series is mandatory for Standard-Projects (If you are unable to attend certain lectures in a series, then attend these lectures in one of the following series)**			
Individual Online Coaching	**Business-Project ▶**	**<u>On demand</u> 5 - 16 individual online sessions for Business-Projects to:**	- Discussing the results of the Project-Story-Book - Planning of the next steps and - Clarifying urgent questions		**At least 1 individual online coaching for each DMAIC phase, up to 16 overall**			
MBB Reviews	**all Projects ▶**		- Review: Each DMAIC phase of Project-Story-Book - Feedback on the success and necessary corrections					- Master Black Belt decides on certification
Management Steering	**Business-Project ▶**	- Confirmation letter of a company manager - Non-Disclosure-Agreement	- Present Project-Story-Book to your Sponsor - Sponsor decides on the focus of the project, necessary adjustments and on the implementation of solutions					- Sponsor decides on the project completion
Timeline (Example)								
Start of Phase		01 - Jan - 20xx	16 - Jan - 20xx	24 - Jan - 20xx	15 - Feb - 20xx	23 - Mar - 20xx	21 - Apr - 20xx	27 - May - 20xx
Duration (days)		14	7	21	35	28	35	28
End of Phase		15 - Jan - 20xx	23 - Jan - 20xx	14 - Feb - 20xx	22 - Mar - 20xx	20 - Apr - 20xx	26 - May - 20xx	24 - Jun - 20xx

… via a predefined Standard-Project or an individual Business-Project