

TATA STEEL

 WeAlsoMakeTomorrow



TQM PROGRAMS

Bringing out the expert in you!



TQM @ Tata Steel

Total Quality Management (TQM) and improvement journey at Tata Steel (TSL) is three-decades old. During this period, the company responded to the changing business needs by adopting and implementing several methodologies and programs like QMS, TPM, Six Sigma, Theory of Constraints (TOC), Shikhar25 etc. The continual pursuit of business excellence has manifested in a deep-rooted culture of TQM orientation. Today, this is one of the core competencies of the organization helping it stay focused on its True North. The systematic approach towards improving / innovating products, processes and services has ensured TSL's leadership position at the marketplace.

Over the years, Tata Steel's TQM practices have been at center stage, both nationally and internationally. In its quest for business excellence, TSL embarked on its Deming journey in 2005; three years later, in 2008, it became the 1st integrated steel plant outside of Japan to win the Deming prize. Continuing with its journey of excellence, in 2012, it once again became the 1st integrated steel company outside Japan to win the coveted Deming Grand Prize! Through the decade long Deming journey, Japanese Quality guru, Dr. Noriaki Kano along with Dr. Shu Yamada and Prof. Ando, mentored the workforce. These interactions helped in deeper understanding of TQM philosophy and its implementation in the organization. These efforts and many more interactions/ working together with various international / national experts has helped in capability development of people and creation of subject matter experts.

Tata Steel runs its own TQM Academy with the help of in-house experts to continuously enhance people capability thereby creating experts of tomorrow!

Knowledge shared is knowledge multiplied! We, at Tata Steel, are happy to spread the knowledge gained over the years, to other organizations, enabling their pursuit of excellence. Several learning missions have been carried out for Tata and non-Tata companies to share some of the best practices, create awareness or train on TQM approaches.

We look forward to create many more ambassadors for journey of excellence!

“Leadership and learning are indispensable to each other.” JFK



250+
trained
in
Problem
Solving

200+
trained
in TOC and
CCPM

80+
trained
in
DM

200+
trained
in
QA &
QMS

About TQM Academy

Vision: To create ambassadors for journey of business excellence!

Mission: To ingrain systems thinking & process approach and drive culture of improvement / innovation leading to superior business results.

TQM Academy was initiated in 2016 to build deeper understanding of improvement methodologies in the organization. It was also to enable confluence of the methodologies under one umbrella. The effort has been to create a congregation of experts equipped with intuitive power to analyze and solve complex business problems innovatively; the proclivity to imbibe structured decision making, in their DNA of operation.

TQM Academy is run by the TQM department, which is also responsible for driving business excellence at Tata Steel.

TQM Academy offers programs on *DMAIC/DMADIC, TOC, CCPM, QA, QMS, DM etc. Classroom teaching, theory and practical case study sessions is delivered by in-house developed and experienced faculty.

In the last 5 years, ~ 700+ people have been groomed under the aegis of the ambitious TQM Academy through classroom based training programs, enriching the human capital of Tata Steel. TQM Academy is now open to create change agents across organizations.

*DMAIC/DMADIC: Define, Measure, Analyze, Design, Improve, Control; TOC: Theory of Constraints; CCPM: Critical Chain Project Management; QA: Quality Assurance; QMS: Quality Management System; DM: Daily Management

Programs offered

i. Quality circles Concept:

(Aims to enhance ability to solve shop floor problems)

- Introduction to Quality Circles
- 12 steps problem solving methodology
- 7 QC tools
- Quality Control Techniques

ii. Daily Management:

(Aims to enable consistent performance through stable process)

- Deciding right KPIs
- Monitoring of KPIs
- Abnormality analysis
- Review (stability & conformity)

iii. QA & QMS

(Aims to enhance the ability to implement Quality Assurance practices)

- Cost of Quality
- QA Standardization, QMS
- Elements of QMS, IATF pillars
- MSA, SPC, QFD, QA Audit

iv. Internal Auditors' training on Integrated Management System

(Aims to strengthen deployment of IMS)

- Risk based thinking
- Process approach
- Standard requirements
- Auditing technique

v. Problem Solving:

(Aims to enhance the ability to solve complex problems)

- Yellow belt
- Six Sigma Green Belt
- Six Sigma Black belt
- DMAIC
- Hypothesis Test
- Modelling & Simulation techniques

vi. Analytics using R/Python:

(Aims to develop experts in data science)

- Introduction to R / Python
- Exploratory data analysis
- Inferential Analysis
- Machine Learning

vii. Theory of Constraints:

(Aims to enhance throughput by exploiting bottlenecks)

- Systems approach
- 5 focusing steps
- TOC thinking
- Flow & Replenishment

viii. CCPM – Project Management:

(Aims to build Project Management capabilities)

- Project Plan
- Project full-kitting
- MS Project
- CCPM software (BM3)

Quality Circles Concept



About the course

Quality Circle is a small team of shop floor employees which continuously identifies and solves problems of their area. This course aims to develop understanding on the methodology and problem solving techniques which can be used to solve the shop floor problems in a structured manner.

Coverage:

- Introduction to Quality Circles
- 12 steps problem solving methodology
- Quality Control Tools and Techniques
 - 7 QC tools
 - Brainstorming
 - Mile stone charts/ Gantt charts
 - Flow Diagrams
 - Priority numbers
 - Why-Why analysis
 - 5W, 1H/ 4W, 1H

Certification

- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to form teams or join existing teams and complete 2 projects using concepts covered in the course. Completed projects will be reviewed by a panel of experts.
- Based on successful completion of the project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- Minimum 1 years industry experience is mandatory

Duration

- 2 days

Daily Management



About the course

The 2-day module aims at creating experts in Daily Management. The training includes hands-on exercise on understanding, implementing and review of Daily Management practices in the organization.

Outcome: Ability to implement and drive Daily Management (DM) at workplace.

Coverage:

Deciding right KPI:

- SDCA, DM Framework
- Roles and Objectives, MoU
- PFC, PFMEA, EFMEA, MSC and KPI drilldown

Monitoring and control of KPIs:

- Establishing control system
- Control charts
- Process capability(Cp, Cpk)

Abnormality analysis

- Handling abnormalities

Review:

- Conformity
- Stability

Certification

- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignment/project using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of the assignment/project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- One who wants to become DM expert and lead DM initiatives
- Should have minimum 2 years industry experience

Duration

- 2 days

QA & QMS



About the course

This 4 day course aims at creating experts in Quality Assurance & Quality Management System. The training includes hands-on exercise, questions, quizzes, etc. It creates an awareness about Quality concepts, thus improving competency of individuals to act as change agents and drive organization wise Quality transformation.

Coverage:

- Three levels of Quality, Kano Model
- Cost of Quality: Types, Impact, TIMWOODS, controlling wastes
- Voice of Customer (QFD, Advanced Kano Model), Understanding MSC
- Abnormality Analysis
- Introduction to QMS (Control Structure, PDCA Cycle, how to implement different standards)
- Tools & Techniques (8D, 7QC, Quality Matrix); Automotive Core Tools (APQP, PPAP, MSA, SPC, FMEA)
- Introduction to Quality Audits
- How Quality Assurance is driven at Tata Steel: An Overview

Certification

- Evaluation at the end of each module.
- Minimum 70% score in each test to qualify for certification.
- Post the training program, participants to complete one project/implement a practice using the concepts taught, in their respective organization. Completed projects will be reviewed by a panel of experts.
- Based on successful completion of project and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- Minimum 2 years industry experience is mandatory.

Duration

- 4 days
- 2 modules of 2 days each with a gap of one month.



Coverage:

- 4 days

Basic Problem Solving (Yellow Belt)



About the course

The course aims to create awareness on structured problem solving, help develop the ability to identify key problems & measures and improve specific process/performance in line with customer/business requirement.

Coverage:

- Problem formulation
- Project charter
- SIPOC
- Probability distribution (normal)
- Sampling techniques
- 7 QC tools
- Measurement System Analysis
- Stability & Normality
- Process capability: CP & CPK
- Simple Linear Regression
- Statistical Process Control
- Control charts
- Quizzes/assignments
- Hands on exercise

Certification

- Evaluation at the end of module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignment/project using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of the assignment/project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- Minimum 2 years industry experience is mandatory.
- Participants with a complex project to work on

Duration

- 3 days



Six Sigma (Green Belt)



About the course

Six sigma is a systematic application of statistical tools for reducing variation, thereby achieving superior business results.

Objective:

- To develop competence in complex Problem Solving using advanced statistical tools.
- To orient participants towards fact based decision making.

Coverage:

- Problem formulation
- Project charter
- SIPOC
- Measuring CTQ
- 7 QC tools
- Measurement System Analysis
- Stability & Normality
- Process capability: CP & CPK
- Hypothesis testing:
 - Parametric
- Modelling techniques: Multiple Linear Regression
- Design of Experiments
- Statistical Process Control
- Hands on exercise on analytical tools

Certification

- Evaluation at the end of each module.
- Minimum 70% score in each test to qualify for certification.
- Post the training program, participants to complete one improvement project using DMAIC methodology.. Completed projects will be reviewed by a panel of experts.
- Based on successful completion of project and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- Minimum 2 years industry experience is mandatory.
- Participants with a complex project to work on

Duration

- 6 days
- 2 modules of 3 days each with a gap of one month.

Six Sigma (Black Belt)



About the course

Black belt, a comprehensive and disciplined model for improvement, the program aims at improving competency of individuals to lead and drive organization wide transformation projects through in-depth understanding of business issue and statistics to make decisions and improve performance.

Black belts have a thorough understanding of DMAIC approach, and are enabled to guide and mentor yellow and green belt projects.

Coverage:

- VoC: QFD, Kano model
- New QC tools
- Data distribution
- simulation techniques
- Hypothesis testing: non parametric tests
- Discriminant Analysis
- Failure/Life time analysis
- PFMEA/DFMEA
- TRIZ
- Control charts for attribute data
- Hands on exercise on advanced analytical tools

Certification

- Evaluation at the end of each module.
- Minimum 70% score in each tests to qualify for certification.
- Post the training program, participant to complete 2 improvement projects using DMAIC methodology. Completed projects will be reviewed by panel of experts.
- Based on successful completion of the project and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- Anyone wanting to become an expert and lead Six Sigma initiatives in an organization.
- Minimum 3 years industry experience is mandatory and should have identified one DMAIC project.
- Green belts can directly attend the 3rd module

Duration

- 10 days : Spread over 3 modules
- First two modules of 3 days each and 3rd module of 4 days.
- There will be a gap of one month between each module.

Analytics using R



About the course

The course aims at developing experts in data science using R programming language. R is one of the most widely used statistical programming language among the data scientists and researchers. The module will introduce basic as well as advanced modelling concepts and in-depth statistics underlying the model execution.

Coverage:

- Introduction to Business Analytics
- Basic programming in R
- Introduction
 - Data Structures
- Exploratory Data Analysis
 - Data Visualization
 - Plots-gg plots, plotly
- Inferential Analysis
- ML algorithms
 - Supervised ML
 - Unsupervised ML

Certification

- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignments using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of the assignment/project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- One who wants to become Data Science expert and lead problem solving initiatives in an organization.
- Min. 2 years industry experience is mandatory.

Duration

- 5 days



Analytics using Python



About the course

The course aims at developing experts in data science using Python programming language. Python is one of the most widely used programming language for Machine Learning. The module will introduce basic as well as advanced modelling concepts and in-depth statistics underlying the model execution.

Coverage:

- Introduction to Business Analytics
- Basic programming in Python
- Introduction
 - Data Structures
- Exploratory data analysis
 - Data Visualization
 - Plots-matplotlib, seaborn
- Inferential Analysis
- ML algorithms
 - Supervised ML
 - Unsupervised ML

Certification

- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignments using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of the assignment/project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- One who wants to become Data Science expert and lead problem solving initiatives in an organization.
- Min. 2 years industry experience is mandatory.

Duration

- 5 days

Theory of Constraints



About the course

The module aims at creating awareness of developing radically new approaches that overcome constraints. It helps to focus on how to look at Constraints and Conflicts that can bring the next breakthrough performance for your organization

Coverage:

- Traditional approach to flow
- Resource dependency & variation
- TOC – Systems approach
- Traditional vs. TOC paradigms
- 5 focusing steps (Dice Game)
- TOC cases
- Goal movie with discussion
- SMED concepts for setup reduction
- Introduction to TOC thinking process
- Conflict resolution with case study
- TOC in Supply Chain
- Solving case study on supply chain

Certification

- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignment/project using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of project and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- One who wants to become TOC practitioner and lead TOC initiatives in an organization.
- Minimum 2 years industry experience is mandatory.

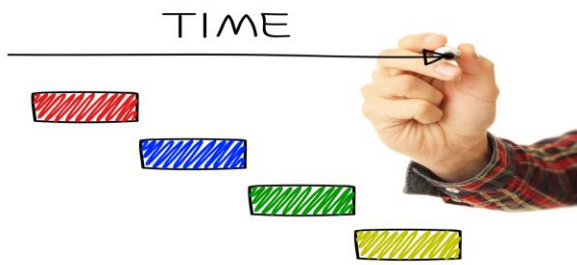
Duration

- 3 days

THEORY
OF
CONSTRAINTS

Critical Chain Project Management

TASK 1
TASK 2
TASK 3
TASK 4



About the course

The CCPM methodology (TOC way of project management) aims to address the basic problems in estimation, planning and execution of projects to address the core issues (dependency, variability and uncertainty) in project management. This program is designed to develop fundamental concept of CCPM and understanding the usage of relevant tools

Coverage:

- Fundamentals of CCPM
- Project Planning
- Full-kitting
- Buffering
- Hands-on in MS Project
- Buffer Management
- Demo in BM3 (CCPM training software)
- Goal movie
- Project discussion

Certification

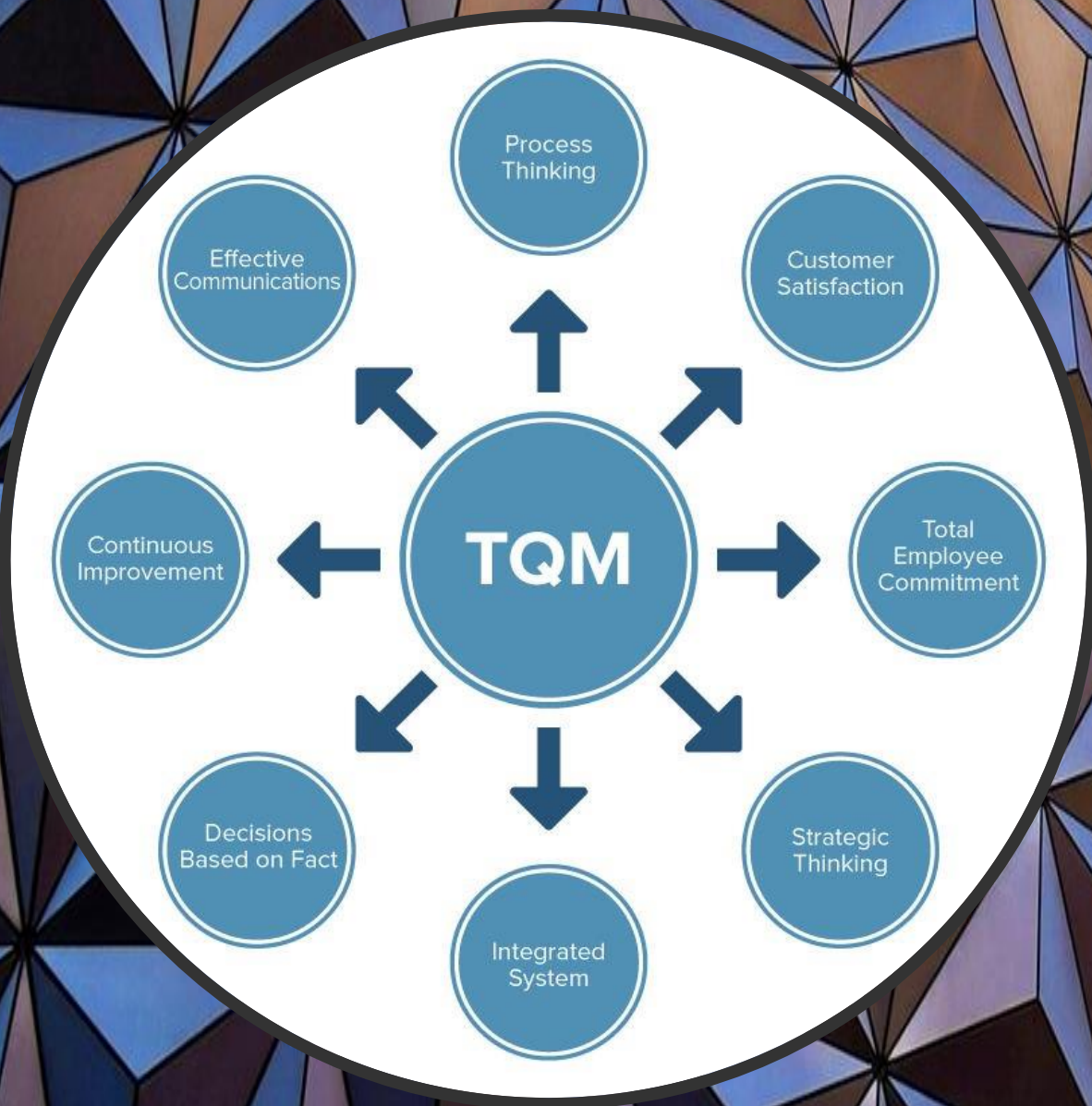
- Evaluation at the end of the module.
- Minimum 70% score in the test to qualify for certification.
- Post the training program, participants to complete assignment/project using concepts covered in the course. Completed assignments will be reviewed by a panel of experts.
- Based on successful completion of the assignment/project work and meeting the qualification requirements in the examination, participants will receive course completion certification.

Who should attend

- One who wants to become CCPM practitioner and lead CCPM initiatives in an organization.
- Minimum 2 years industry experience is mandatory.

Duration

- 2 days



Total Quality Management