# INDIAN STATISTICAL INSTITUTE

**SQC & OR UNIT, HYDERABAD**

*Certifies*

*Yamulla Mallesham, Arete IR LLP.*

*as* **Six Sigma Black Belt**

*with* **Business Analytics**

*Conducted During March - April 2024*

Certificate No. : ISI/SSBB/08

Date : 20 May 2024

**(Dr. S.M. Subhani)**
Head, SQC & OR Unit

**(G Murali Rao)**
Program Director & Faculty

(Course Details are given overleaf)

# Six Sigma Black Belt with Business Analytics Curriculum

## Six Sigma DMAIC

- An Introduction to Quality/Six Sigma / Business Excellence
- Six Sigma Architecture and DMAIC Methodology

- **Define Phase :**
  - Voice of Customer (VOC), Kana Analysis & QFD
  - Critical to Quality Characteristics (CTQ) and Big Y
  - Process Mapping (SIPOC) and Project Charter Development

- **Measure Phase :**
  - Understanding Data and its precautions/processing
  - Descriptive Statistics, Probability & Probability Distributions
  - Performance Evaluation - MSA, Stability & Capability, Sigma Level etc

- **Analyze Phase :**
  - Benchmarking and Gap Analysis
  - Detailed Process and Root Cause Analysis. Problem Solving Techniques
  - Root Causes Validations - Inferential Statistics

- **Improve Phase :**
  - Establishing Variable (Root Cause) Relationships, Regression Modelling
  - Solution Generations – Desing of Experiments
  - Finding the optimal solution and validation

- **Control Phase :**
  - Evaluation of the Improved Process
  - Developing Control Plans – Full Proof and Process Control Systems
  - Implementation of Controls and achieving Sustenance

## Business Analytics / Data Science

- An Introduction to Business Analytics / Data Science / Machine Learning / Artificial Intelligence
- An Introduction to open-source programming tools (Python/R Programming) for Analytics
- Understanding multi-dimensional large volumes of data/big data.
- Data Preparation / Data Cleaning Methodologies
- Data Visualization – Understanding the underlying behaviour and interpretation through graphs and charts.
- Exploration of data using statistical methods – Data Mining
- Describing data and deriving meaningful information – Descriptive Analytics.
- Postulating existing/new theories and validation for drawing significant inference on the theories.
- Introduction to Machine Learning and Statistical Modelling
- Supervised Learning Methods – Machine Learning Algorithms
  - Understanding Classification and Regression Methods/Models
  - Ordinary Least Square (OLS) Methods/Models
  - Model Diagnostics, Feature Engineering, Resampling Methods etc.
  - Logistic, Discernment, KNN Methods/Models
  - Tree Based Methods/Models – Decision Trees
  - Ensembled Methods/Models – Random Forest, Bagging, Boosting.
  - Text Mining, NLP, Sentiment Analysis etc.
  - Association Rules and Market Basket Analysis.
  - Time Series & Forecasting Models
- Unsupervised Learning Methods
  - Clustering Methods
  - Principal Component Analysis
  - Discriminant Analysis
- Artificial Intelligence (introductory)
  - Deep Learning Algorithms – Neural Networks etc.
  - Generative AI/LLM Algorithms.

### Program Design:

FOUR fundamental skill/knowledge dissemination modes. 1. Online Class Room Teaching 2. Online Hands-on Sessions 3. Assignments and 4. Project/Dissertation work. Datasets/Case Studies/Published Papers for Hands-on Sessions/assignments. Statistical Software/Tools : Minitab and Python.

### Schedule :

Total duration of the program : Approximately 70 hours spread over two months (March & April 2024), Online during weekends (Saturdays & Sundays 4 hours per day 9.00 AM to 1.00 PM).

### Certification Criteria

- Fully attending all the sessions of the course online.
- Submitting all the assignments on time
- Submitting a Six Sigma/Business Analytics/Data Science Project/Dissertation work
- Securing at least 70% Marks in the Overall Assessment (Periodic Evaluations/Assignments/Final Examination/Project/Dissertation work).