



Commemorating 125<sup>th</sup> Birth Anniversary Year of  
**Professor Prasanta Chandra Mahalanobis**  
(Founder of Indian Statistical Institute)



**Indian Statistical Institute**  
SQC & OR Unit, Hyderabad  
Announces

**Certification Program on**

**Business Analytics**

**Duration**

**February – June, 2018**  
(Starting on 11<sup>th</sup> Feb. 2018)

**Part Time**

**(Only on 15 Scheduled Sundays)**

**Last Date for Registration**  
**5<sup>th</sup> February, 2018**

**K Venkata Ramana**  
Program Facilitator

For any further details Contact/Mail/Visit :

(040) 27153984 / 27171906  
[baisihyd@gmail.com](mailto:baisihyd@gmail.com)  
[www.isihyd.ac.in](http://www.isihyd.ac.in)

**G Murali Rao**  
Program Director

Indian Statistical Institute, Street No 8, Habsiguda, Hyderabad-500007

## Introduction

Indian Statistical Institute, Hyderabad announces a certification program on "**Business Analytics**" during February to June 2018 (15 Scheduled Sundays). "DATA" is gradually becoming the primary corporate resource and the new driver of Business. The need of the hour is to effectively identify the highly impactful information hidden in the Data and translate them as Critical To Customer (CTC) & Critical To Business (CTB) requirements of an organization for developing new business models or optimizing the existing ones for achieving maximum customer satisfaction, beating competition and profitability. Efficient Mining of the Data using Statistical & Machine Learning methods help in developing robust predictive models for building Intelligent Systems which can help in taking futuristic decisions and actions. The core objective of this program is to develop the Statistical & Analytical skills of individuals so as to enable them to analyse big and multidimensional complex data in the most efficient & effective manner and building predictive business models for developing business strategies.

## Big Data (BD)

Big data is a collection of large data sets (size, dimensionality, complexity etc.) archived across all stake holders of an organization over a number of years and made available for analysis. The need for analysis of big data arises from the fact that it has the potential to provide the hidden and generally unknown information which has the potential to transform an organization in the market. These large and complex data sets cannot be processed efficiently using traditional methods & tools. Challenges in analysis include understanding, cleaning, searching, visualization, modelling, prediction etc. Statistical Methods, both advanced as well as simple provide excellent techniques to analyse big data efficiently

## Business Analytics (BA)

The core objective of Business Analytics is to provide optimal business solutions using the predictive models developed using data and analytics. Present day Business is being driven by 3 D's (Data, Dimensions and Discovery). In this highly competitive, customer dominating and cost sensitive market, success of an organization is becoming directly proportional to its ability to extract maximum information from the tera/penta... bytes of complex **Data** on multiple **Dimensions** of customers/organizational processes for **Discovering** the unknown strategies of achieving Business Excellence. Business analytics can be efficiently executed by individuals trained in Statistical and Optimization Techniques for effectively handling Big Data. Traditional data analysis methods are no doubt required but they are not efficient for handling multidimensional big data for predictive analytics.

## Curriculum

The curriculum of this certification program on Business Analytics is meticulously designed to enable a help the professional to learn and understand the data analytics methodologies analytical skills to handle big data by understanding, cleaning, structuring, building predictive models and finally providing an optimal solution to a strategic business issue of an organization. The detailed curriculum is given in the Annexure - I

**Program Structure** : The whole program is designed under **FOUR** fundamental skill/knowledge dissemination modes with classroom session on **15 Scheduled Sundays during Feb-June 2018**. **1. Class Room Teaching 2. Hands-on Sessions 3. Weekly Assignments and 4. Project Work/Dissertation**. Datasets/Case Studies/Published Papers will be used for the Hands-on Sessions/assignments works. Statistical Software such as Minitab, R and Statistica will be used during the program.

## Who Can Attend

Professionals/Executives/Scientists/Researchers (Minimum Degree/Diploma Holders) who are working in the areas of Data Sciences, Analytics, Quality etc. with adequate mathematics/Statistics background and interested to pursue their career/work in the areas of Business Analytics.

*(Note : Registration will be primarily based on first come first served basis but Qualification, Experience and Suitability will also be considered)*

## Certification Criteria

- Minimum 75% attendance
- Minimum 70% Marks in the Overall Assessment. (The Overall Assessment consists of Evaluation/Marks in 1. Weekly Assignments 2. Periodical Examinations 3. Group Exercises/Presentations 4. Project/Decertation Work and 5. Final Examination.  
(Note : Every participant need to take up a Project Work And/Or Dissertation and submit the reports for evaluation)

**Certificates will be awarded to the qualified candidates on 29<sup>th</sup> June 2018**

**(On the Occasion of 125<sup>th</sup> Birth Anniversary of Prof. P C Mahalanobis, Founder of Indian Statistical Institute)**

**Program Fee :** Rs 25,000/- (per participant) (plus GST @ 18%). A pen-drive with Lecture Notes and Opensource data/books/published papers/software will be given as program kit. Tea with biscuits(2 times) will be served on the days of the program (participants need to make their own arrangements for lunch) Classroom sessions will be only on 15 Sundays during Feb.-June 2018.

**Payment Mode :** Selected/eligible candidates need to pay the fee along with the applicable taxes in full at the beginning of the program (Part payment is not acceptable) in the form of **Demand Draft drawn in the favour of Indian Statistical Institute, Payable at Hyderabad or Online (NEFT) Bank Transfer (Syndicate Bank, J S N Colony, Habsiguda, Hyderabad. A/C No : 30451010000079 & IFSC Code : SYN0003045**

**Venue :** Lecture Hall, Indian Statistical Institute, Hyderabad                      **Timings :** 0930 to 1730 hrs (Only Sundays)

**Faculty :** Senior Faculty with over 30 years of experience in Academic Teaching / Research / Industrial Consultancy / Training And Business Analytics Professionals/Data Scientists from Industry/Institutions.

### **Registration Procedure**

Registration will on a **First come First Served** basis (Eligible Candidates). Registration Form along with the details as specified in the form need to reach along with the fee to the Program Facilitator on or before **5<sup>th</sup> February 2018**.

(After confirmation of registration, fee once paid will not be returned).

# Curriculum

Annexure - I

## 1. Overview of Business Analytics

- What is Bigdata and Business Analytics
- Present day Business and need for Data Analytics
- Over view of Data Mining and Data Analytics Techniques
- Execution of Data Analytics - A Model : **DEMOP**

## 2. Basic Mathematics for Business Analytics

## 3. Business Analytics - I (Data Management)

- Understanding types of data
- Data Aggregation
- Data Scrutiny and Cleaning

## 4. Business Analytics - II (Descriptive Analytics)

- Statistical Thinking and its importance in Data Analytics
- Data visualization/Graphical Methods
- Descriptive Statistics and importance of summary measures
- Measures of central tendency and Dispersion
- Measures of Shape - Skewness and Kurtosis

## 5. Business Analytics - III (Data Characterization)

- Understanding Uncertainty
- Theory of Probability & Basic Rules
- Conditional Probability and Bayes' theorem
- Important Probability Distributions

## 6. Business Analytics - IV (Data Analysis and Exploration)

- Exploratory Data Analysis Techniques (EDA)
- Theory of Estimation and Sampling Distributions
- Decision Making - Inferential Statistics
- Hypothesis Testing (Parametric and Non Parametric)
- ANOVA and General Linear Model

## 7. Business Analytics - V (Unsupervised Learning)

- Feature or Variable Selection
- Need for Dimension Reduction Methods
- Principal Component, Discriminant, Factor & Cluster Analysis
- Market Basket Analysis /Customer Segmentation
- Text Mining
- Sentiment Analysis

## 8. Business Analytics -VI (Predictive Analytics)

- Introduction to Statistical Model Building
- Simple and Multiple Linear Regression models.
- Generalized Regression Models (Logistic, LDA, QDA etc.)
- Resampling Methods (Cross Validation, Bootstrap etc.)
- Regression Diagnostics
- Model Selection (Best Subset, Stepwise, Shrinkage etc.)
- Non Linear Regression Models (Splines, GAM etc.)
- Tree Based Methods (CART, Bagging, Boosting and Random Forest)
- Time series/Forecasting Models

## 9. Business Analytics - VII (Optimization)

- Overview of Operations Research & Problem Formulation
- Basic Optimization Techniques/Case Studies
- Response Surface Optimization

## 10. Business Analytics - VIII (Machine Learning)

- Overview of Artificial Intelligence, Machine Learning/Deep Learning etc.
- Artificial Neural Networks (ANN)
- Naïve Bayes Classifiers
- KNN Methods
- Support Vector Machines

**Statistical Software : Minitab/R Programming/Statistica/Lingo**

## About the Institute

The Indian Statistical Institute (I.S.I.), founded by Professor Prasanta Chandra Mahalanobis, grew out of the Statistical Laboratory set up by him in the Presidency College in Kolkata in the year 1931. In 1959, in recognition of the role of statistics as a key technology of the modern times and the importance of the Institute in the development and application of statistics, the Parliament of India enacted the Indian Statistical Institute Act, declaring it an Institution of National Importance. The Institute is now considered as one of the foremost centres in the world for training and research in statistics and related sciences. In keeping with this long tradition, the Institute has been engaged in developing statistical theory and methods and their practical applications in various branches of science and technology.

The major objectives of the Institute, as given in its Memorandum, are

to promote the study and dissemination of knowledge of statistics, to develop statistical theory and methods, and their use in research and practical applications generally, with special reference to problems of planning of national development and social welfare;

to undertake research in various fields of natural and social sciences with a view to the mutual development of statistics and these sciences;

to provide for, and undertake, the collection of information, investigation, projects and operational research for purposes of planning and the improvement of efficiency of management and production.

The Institute initiated the Quality Movement in India as early as 1947. Through its SQC & OR Division the Institute is providing assistance to Indian industry relentlessly since then to achieve high quality and productivity at an affordable cost.

## About the SQC & OR Unit, Hyderabad

The Statistical Quality Control and Operations Research (SQC & OR) Unit at Hyderabad of the Indian Statistical Institute was established in the year 1974 with the objective of helping industries in Andhra Pradesh and also industries of other states close to Hyderabad for promoting and propagating statistical and quality management methodologies.

The SQC & OR Unit, Hyderabad is one of the major Units of the SQC & OR Division of the Indian Statistical Institute. SQC & OR Division was created by Professor Mahalanobis exclusively for helping the Indian industries in managing quality and productivity problems with the application of Statistical as well as Quality Management methodologies.

SQC & OR Unit, Hyderabad has immensely contributed to the SQC & OR Division's activities such as

- Playing a pioneering role in the Quality Movement in India and setting path for quality control and improvement activities for the Indian industries through promotion and applications of statistical and operations research methodologies.
- Serving the industries in India and abroad over the last five decades by providing training and consultancy on quality concepts and methodologies such as TQM, Taguchi Methods, Quality Function Deployment, Six Sigma, and Quality Systems.
- Collaborating and exchanging ideas with quality gurus. Some experts like Shewhart, Deming, Juran, Taguchi, Ishikawa, Ott, Tippet and Suda visited ISI at various points of time and interacted with ISI faculty.

A large number of Manufacturing, Service, IT, BPO & KPO industries have been benefitted by the services of SQC & OR Unit Hyderabad. Reliance, ITC, Wipro, HSBC, BHEL Dr. Reddy's etc. to name a few.



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(Founder of Indian Statistical Institute)

# Indian Statistical Institute

SQC & OR Unit, Hyderabad

Certification Program on

## Business Analytics

February to June 2018, Starting on 11<sup>th</sup> February 2018

(Only on Sundays - Classroom OR Assignments)

Program Starting from 11<sup>th</sup> February 2018

### Registration Form

#### Participant (s) Details

Sl. No	Name	Organization	Designation	Age	Highest Qualification	Years of Experience (Analytics/Quality)
1						
2						

#### The following details need to be provided for each participant

- Brief (max : one or two pages) CV/Resume of the participant(s) describing his/her Education Background, experience in Analytics/Quality, Undertaking application Projects using Statistical/Analytics Methods.
- Scanned/Photo copy of the Marks Memo (School - 10<sup>th</sup> and Highest Degree)

**Details of Program Fee** Rs. 25,000/ + GST @ 18% (Demand Draft drawn in the favour of Indian Statistical Institute, Payable at Hyderabad OR through NEFT)

No. of Participants	Payable Program Fee	GST (18%)	Demand Draft Particulars	Bank Transfer (NEFT) Particulars

#### Contact Details

**Address :**

Mobile :

Email :

Name & Signature