

# FOUNDATION OF STATISTICS FOR DATA ANALYTICS (DATA ANALYTICS)

## DNA-105

Duration: 3 days; Instructor-led | Virtual Instructor-led

### WHAT YOU WILL LEARN

This programme is created specifically for learners who wish to develop, apply and evaluate algorithms, predictive data modelling and data visualisation to identify underlying trends and patterns in data.

### Knowledge and Skills Acquired:

- Organisational domain(s) and key business processes
- Methods to use analytics to tell the story of the data
- Methods to use exploratory visual analysis and predictive modelling
- Methods to identify and prioritise the problems to be solved
- Methods to develop prototype algorithms
- Methods to build a data model
- Methods to use data mining to discover new business insights
- Methods to interpret patterns in data and their relevance to business issues
- Range of established and novel tools and techniques used in developing new business insights
- Methods to apply complex software tools to analyse data
- Use of statistical techniques, experimental techniques, and hypothesis testing
- Apply predictive data modelling techniques to identify underlying trends and patterns in data using statistical computing tools, methods and procedures
- Identify patterns across multiple data sets to derive insights
- Develop prototype algorithms and proof of concept demonstrations
- Make decisions about which patterns are meaningful, and which to further analyse
- Assemble data aggregations to build data models to help test
- problem hypotheses
- Use machine learning techniques to gain new insights from data

- Mine data to find relevant insights to develop ongoing improvements
- Asses the business insights presented to determine impact of insights on organisation
- Manage the creation of interactive visualisations of data and data study outcomes
- Use industry standard tools and techniques for data visualisation in line with organisational procedures

### COURSE CONTENTS

#### MODULE 1: INTRODUCTION TO FOUNDATION OF STATISTICS FOR DATA ANALYTICS

##### Topics:

- Introduction to business analytics
- Use cases of predictive analytics in business
- Introduction to Foundation of Statistics

##### Mapped to:

- K1 Organisational domain(s) and key business processes
- K4 Methods to identify and prioritise the problems to be solved
- K11 Use of statistical techniques, experimental techniques, and hypothesis testing
- A1 Apply predictive data modelling techniques to identify underlying trends and patterns in data using statistical computing tools, methods and procedures

#### Rationale for Sequencing of the Units

The first learning unit starts with an overview and introduction of the Foundation of Statistics course, to begin the building blocks in statistical techniques, hypothesis testing and predictive analytics.

#### MODULE 2: DATA SCOPING, EXPLORATION AND SENSE MAKING

##### Topics:

- Business measurement and data
- Data connection, size and quality
- Data exploration visually

**Mapped to:**

- K3 Methods to use exploratory visual analysis and predictive modelling
- K7 Methods to use data mining to discover new business insights
- A2 Identify patterns across multiple data sets to derive insights
- A4 Make decisions about which patterns are meaningful, and which to further analyse

**Rationale for Sequencing of the Units**

Subsequently, the next learning unit teaches learners on data scoping, data exploration and data sense making through predictive modelling, data mining, etc.

With the data set, they begin to learn about data pattern recognition and which patterns to analyse and investigate further. .

**MODULE 3: DATA INSIGHT EXTRACTION AND EXPLANATION**
**Topics:**

- Data insight extraction
- Data analytics results interpretation
- Data analytics results recommendation

**Mapped to:**

- K8 Methods to interpret patterns in data and their relevance to business issues
- A6 Use machine learning techniques to gain new insights from data
- A7 Mine data to find relevant insights to develop ongoing improvements
- A8 Assess the business insights presented to determine impact of insights on organisation

**Rationale for Sequencing of the Units**

In the next learning unit, the learners move to the next step in the sequence whereby they extract data for insight and analysis. Learners are taught methods such as clustering and decision tree.

**MODULE 4: DATA MODELS AND PROTOTYPING ALGORITHMS**
**Topics:**

- Algorithm development process framework
- Data selection and model development to support algorithms training and testing
- Algorithm comparison
- Algorithm recommendation

**Mapped to:**

- K5 Methods to develop prototype algorithms

- K6 Methods to build a data model
- A3 Develop prototype algorithms and proof of concept demonstrations
- A5 Assemble data aggregations to build data models to help test problem hypotheses

**Rationale for Sequencing of the Units**

In the next learning unit, the learners are brought through data models and developing proof of concept algorithms.

**MODULE 5: DATA STORYTELLING**
**Topics:**

- Introduction to Data Storytelling
- Intrinsic characteristics of data
- Overview of data visualisation and patterns
- Alignment of reporting needs and choice of metrics and visualization

**Mapped to:**

- K2 Methods to use analytics to tell the story of the data
- K9 Range of established and novel tools and techniques used in developing new business insights
- K10 Methods to apply complex software tools to analyse data
- A9 Manage the creation of interactive visualisations of data and data study outcomes
- A10 Use industry standard tools and techniques for data visualisation in line with organisational procedures

**Rationale for Sequencing of the Units**

The last learning unit pulls the building blocks together. Learners have been brought through data analysis, to data analytics and learn about data visualisation and data storytelling.