

Day 1

Module 1 – Introduction

- Scope and Objectives
- Basic Concepts
 - Describing Literacy
 - Describing Data Analytics
 - Describing Data Analytics Literacy
- Workshop Overview
 - Introduction
 - Topics
 - Tips and Suggestions
 - Schedule
 - Workshop Scenario

Module 2 – Core Foundation Skills

- Problem Framing
 - Definition of Problem Framing
 - Concepts Needed for Problem Framing
 - Technique and Template for Defining the “Frame”
 - **Activity 1 – Problem Framing (40 minutes)**
 - Students work in teams framing the problem described in the course scenario to define the key decision variables and outcome variables that will drive the creation of an analytic model.
- Problem Solving
 - Definition of Problem Solving
 - Technique – Influence Diagramming
 - **Activity 2 - Problem Solving (30 minutes)**
 - Student teams develop an influence diagram that conceptually shows how key variables from Activity 1 are logically connected in order to derive the problem solution.
- Goal Setting
 - Definitions of Goals
 - Concepts – The SMART Goal Framework
 - Techniques for Goal Setting
 - **Activity 3 – Goal Setting (30 minutes)**

- Student teams set meaningful and useful goals based on the course scenario. The goals will be defined using the SMART framework described in the lecture.
- Goal Attainment
 - Concepts – Action Planning
 - Concepts – Targets and Thresholds
 - Planning Technique – Fish Bone Diagram
 - **Activity 4 – Goal Attainment (30 minutes)**
 - Teams will create an action plan and a monitoring method needed to accomplish one of the goals defined in Activity 3.
- Numeracy
 - Definition
 - Concepts and Key Topics
 - Techniques
 - Percentages
 - Fractions
 - Growth
 - Order of Operations
 - Ranking and Ordering
 - Probability
 - Statistics
 - **Activity 5 – Numeracy (30 minutes)**
 - Student teams will practice a series of skills supporting numeracy. Numeracy provides capability to confidently use and apply numerical data in everyday situations. Numeracy helps us to think mathematically to make estimates, identify possibilities, evaluate options and make decisions

Module 3 – Data Skills

- From Data to Information
 - Definitions – Basic Descriptive Statistics
 - Concepts – Different Types of Means (Arithmetic, Harmonic, Geometric)
 - Choosing the “Proper” Mean
 - Arithmetic Mean Application
 - Harmonic Mean Application
 - Geometric Mean Application
 - Calculation Techniques
 - **Activity 6 - From Data to Information (45 minutes)**

- Student teams will develop and practice some of the skills needed to extract meaningful information from sets of business measurement data. Appropriate selection of the proper “mean” to summarize data will be explored.
- Measurement
 - Definitions
 - Accuracy and Precision Concepts
 - Techniques for Business Measurement
 - **Activity 7 – Measurement (30 minutes)**
 - Student teams will analyse measurement data based on the course scenario. Activities include determining the appropriate type of mean to measure central tendency, dealing with precision vs accuracy issues and estimating the impact of measurement error on decision making.

Day 2

Module 4 – Information Skills

- Interpretation and Visualization
 - Definitions
 - Categories and Properties of Data
 - Variable Types and Measurement Scales
 - Data Summary Techniques
 - Visualization References
 - Presentation Techniques – Tables, Plots, Maps
 - **Activity 8 – Interpretation and Visualization (30 minutes)**
 - Student teams will apply some of the skills needed to interpret data that is presented graphically. This capability is enabled by developing your knowledge and practicing your skills in the following areas.
 - categories and properties of data
 - formatting and presenting data
 - reading and interpreting data
- Quantitative and Statistical Thinking
 - Definition of Quantitative and Statistical Thinking
 - Probability Basics
 - Probability vs Statistics
 - Statistical Techniques
 - Standard Deviation
 - Normal Distribution

- **Activity 9 – Quantitative and Statistical Thinking (45 minutes)**
 - Student teams will practice turning available data into meaningful information. Questions related to course scenario will be answered using statistical thinking concepts applied to decision making challenges provided in the scenario.

Module 5 – Insight Skills

- Analysis
 - Definitions
 - Interpreting New Evidence and Bayes’ Rule
 - Bayes Rule Technique for calculating Conditional Probabilities
 - **Activity 10 – Analysis (45 minutes)**
 - Student teams will explore techniques that allow them to modify their beliefs based on the introduction of new evidence. The technique is based on applications of Bayes Rule and concepts of conditional probability.
- Synthesis
 - Definitions
 - Systems Thinking Concepts
 - System Models
 - **Activity 11 – Synthesis (45 minutes)**
 - Student teams will develop and apply some concepts related to “synthesis” by combining different techniques to answer questions from the course scenario. The combination or synthesis of techniques can help generate a key insight we are looking for. It can help identify which “knob” we can turn to improve our situation. Knowing which “knob” to turn and how far to turn it form the insights needed to drive our decisions that lead to the actions needed to improving our situation or process.

Module 6 – Workshop Summary

- Final Comments and Review