**Course:** **A Practical Approach to Probability and Statistics for Business Professionals**

**Guided Learning Hours:** **12**

**Pre-requisite:** **None**

## Abstract

The main objective of this course is to provide participants with the foundations of statistical inference mostly used in business and economics.

Topics include: discrete and continuous probability distributions, confidence intervals, hypothesis testing and an introduction to linear regression.

## Learning Outcomes

On completion of this course, learners will be able to:

1. Understand the different types of numerical data
2. Understand the basic concepts of probability and probability distributions
3. Construct and interpret confidence intervals
4. Conduct hypothesis tests
5. Understand how to apply statistical methods to investigate the relationship between two variables

## Course Content

***Learning Outcome 1: Understand the different types of numerical data***

- Explain the differences between quantitative and qualitative variables and between continuous and discrete variables

***Learning Outcome 2: Understand the basic concepts of probability and probability distributions***

- Explain the conditions under which the binomial distribution may be applied and show how Binomial probabilities can be calculated.

- Explain the conditions under which the Poisson distribution may be applied and show how Poisson probabilities can be calculated.
- Explain the characteristics of the Normal distribution and discuss the conditions under which it can be applied.
- Show how probabilities can be calculated by using the Normal distribution tables to find areas under the standard normal curve.

***Learning Outcome 3: Construct and interpret Confidence Intervals***

- Show how the Normal distribution can be used to determine confidence intervals for means and proportions.

***Learning Outcome 4: Conduct Hypothesis Tests***

- Discuss the meaning of Hypothesis testing and explain its importance to business decision-making.
- Clarify the terms 'null hypothesis', 'alternative hypothesis' and the 'level of significance'. Distinguish between one-tailed and two-tailed tests and Type I and Type II errors.
- Show how Hypothesis tests of a single mean and single proportion are conducted using the Normal distribution with an emphasis on the interpretation of results.

***Learning Outcome 5: Understand how to apply statistical methods to investigate the relationship between two variables***

- Use numerical examples to calculate Pearson's coefficient of correlation and interpret the result.
- Apply the method of least squares to estimate the coefficients of a two-variable linear regression equation.
- Explain how the regression equation can be used for making predictions.