



Level 6 Advanced Diploma in Management (891)
149 Credits



Unit: Business Statistics	Guided Learning Hours: 260
Exam Paper No.: 4	Number of Credits: 26
Prerequisites: Knowledge of management terminology.	Corequisites: A pass or higher in Diploma in Management or equivalence.
<p>Aim: This unit is an applications-oriented study of statistical concepts, techniques and statistical methods used in business research, analysis and decision making; preparation and presentation of data, frequency distributions, measures of central tendency and dispersion, statistical inference, regression and correlation. The unit focuses on the learner as user of statistics requiring minimal understanding of mathematical theory and formula derivation. Major topics of study are visualizing data, central tendency, dispersion, distributional shapes, sampling distributions, confidence intervals, discrete and continuous probability distributions, comparison tests, association tests, and regression. The objectives of the unit are to develop the skill to apply these concepts in conjunction with computer usage and make appropriate decisions regarding actual business problems.</p>	
Required Materials: Recommended Learning Resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: The unit requires practical use of Excel software.	
<p>Intended Learning Outcomes:</p> <p>1 Qualitative and quantitative data; nominal, ordinal, interval, and ratio scales of measurement.</p> <p>2 Probability, sample space, and event; the complement of an event and the intersection and union of two events.</p> <p>3 Understand discrete and continuous random variables; how a random variable is characterised by its probability distribution and identifying when a random variable will be normally distributed; converting a binomial distribution into an approximated normal distribution.</p>	<p>Assessment Criteria:</p> <p>1.1 Describe the difference between a population and a sample.</p> <p>1.2 Calculate and interpret percentiles and quartiles.</p> <p>1.3 Explain measures of central tendency and how to compute them.</p> <p>1.4 Create different types of charts that describe data sets.</p> <p>1.5 Use Excel to compute various measures and create charts.</p> <p>2.1 Distinguish between subjective and objective probability.</p> <p>2.2 Compute probabilities of various types of events.</p> <p>2.3 Explain the concept of conditional probability and how to compute it.</p> <p>2.4 Describe permutation and combination and their use in certain probability computations.</p> <p>2.5 Explain Bayes' theorem and its application.</p> <p>3.1 Compute statistics about a random variable.</p> <p>3.2 Compute statistics about a function of a random variable.</p> <p>3.3 Compute statistics about the sum of a linear composite of random variables.</p> <p>3.4 Describe how to solve problems involving standard distributions manually using formulas.</p> <p>3.5 Describe how to solve business problems involving standard distributions using spreadsheet.</p> <p>3.6 Demonstrate how to use the properties of the normal distribution.</p> <p>3.7 Explain the significance of the standard normal distribution.</p> <p>3.8 Demonstrate how to compute probabilities using normal distribution tables.</p> <p>3.9 Demonstrate how to transform a normal distribution into a standard normal distribution.</p>

<p>4 Understand how to take random samples from populations, the need to compare two population parameters and be able to conduct an independent-samples test for difference in population means.</p>	<p>4.1 Distinguish between population parameters and sample statistics. 4.2 Describe how to apply the central limit theorem. 4.3 Evaluate and derive sampling distributions of sample means and proportions. 4.4 Explain why sample statistics are good estimators of population parameters. 4.5 Identify special sampling methods. 4.6 Describe how to conduct a paired-difference test for difference in population means. 4.7 Describe why a paired-difference test is better than an independent-samples test. 4.8 Describe how to conduct a test for difference in population proportions. 4.9 Examine and test whether two population variances are equal.</p>
<p>5 Confidence intervals; computing confidence intervals for special types of sampling methods; and the reasons why hypothesis testing is important given the sample size and significance level hypothesis test.</p>	<p>5.1 Compute confidence intervals for population means. 5.2 Compute confidence intervals for population proportions. 5.3 Compute confidence intervals for population variances. 5.4 Compute minimum sample sizes needed for an estimation. 5.5 Describe the role of sampling in hypothesis testing. 5.6 Identify type I and type II errors and discuss how they conflict with each other. 5.7 Examine and interpret the confidence level, the significance level, and the power of a test. 5.8 Compute and interpret p-values.</p>
<p>6 The purpose of analysis of variance (ANOVA) in testing differences between two or more means and determining whether a regression experiment would be useful in a given instance; the advantages of multiple regression designs over the factorial designs.</p>	<p>6.1 Describe the model and computations behind ANOVA. 6.2 Explain the test statistic F. 6.3 Conduct a one-way ANOVA. 6.4 Conduct a two-way ANOVA. 6.5 Describe how to formulate a regression model. 6.6 Compute a regression equation. 6.7 Compute confidence intervals for regression coefficients. 6.8 Compute a prediction interval for a dependent variable. 6.9 Compute the covariance and the correlation coefficient of two random variables</p>
<p>7 Analysing whether multiple regression would be applicable to a given instance and determining which independent variables are to be included in a multiple regression model.</p>	<p>7.1 Demonstrate how to formulate a multiple regression model. 7.2 Test the validity of a multiple regression by analyzing residuals. 7.3 Describe how to carry out hypothesis tests about the regression coefficients. 7.4 Compute a prediction interval for the dependent variable. 7.5 Describe how to use indicator variables in a multiple regression. 7.6 Be able to carry out a polynomial regression.</p>
<p>8 Differentiating between qualitative and quantitative methods of forecasting and assessing</p>	<p>8.1 Be able to carry out a trend analysis in time series data.</p>

the efficiency of forecasting methods using measures of error.	8.2 Identify seasonal and cyclical patterns in time series data.
	8.3 Describe how to forecast using simple and weighted moving-average methods.
	8.4 Describe how to forecast using the exponential smoothing method.
	8.5 Describe how to forecast when the time series contains both trend and seasonality.
9 Determining when to use control charts and creating control charts for sample means, ranges, and standard deviations.	9.1 Create control charts for sample proportions.
	9.2 Create control charts for a number of defectives.
	9.3 Draw Pareto charts using spreadsheets.
	9.4 Draw control charts using spreadsheets.
10 Differentiating between parametric and nonparametric tests; conducting a Mann-Whitney test for comparing population distributions and Wilcoxon test for paired differences.	10.1 Describe how to conduct a sign test to compare population means.
	10.2 Describe how to conduct a runs test to detect abnormal sequences.
	10.3 Be able to conduct a Friedman test for randomised block designs.
	10.4 Compute Spearman's rank correlation coefficient for ordinal data.
	10.5 Conduct a chi-square test for goodness of fit.
	10.6 Be able to conduct a chi-square test for independence.
	10.7 Conduct a chi-square test for equality of proportions.
Methods of Evaluation: A 3-hour written examination paper with five essay questions, each carrying 20 marks. Candidates are required to answer all questions. Candidates also undertake project/coursework in Business Statistics with a weighting of 100%.	

Recommended Learning Resources: Business Statistics

Text Books	<ul style="list-style-type: none"> • Business Statistics: A Complete One Semester Course by Sonia Taylor. ISBN-10: 0333794451 • Complete Business Statistics with Student CD by Amir D Aczel. ISBN-10: 0071244166 • Basic Business Statistics: Concepts and Applications by Mark L Berenson , David M. Levine , Timothy C. Krehbiel. ISBN-10: 0135009367 • Business Statistics in Practice w/Student CD by Bruce L Bowerman , Richard T O'Connell. ISBN-10: 007128091X
Study Manuals 	BCE produced study packs
CD ROM 	Power-point slides
Software 	None