






Level 6 Advanced Diploma in Data Science & Business Analytics (952) 210 Credits

Unit: R Data Analysis Fundamentals	Guided Learning Hours: 300
Exam Paper No.: 3	Number of Credits: 30
Prerequisites: Computer knowledge and use of Excel	Corequisites: A pass or higher in Diploma in Diploma in Analytics or equivalence.
<p>Aim: The purpose of the course is to introduce R Studio to learners. Data structures, functions, Excel/CSV files and graphics is at the core of data analysis. The course outlines the implementation of R from installation, object manipulation, pre-processing and storage of data and R binary files.</p> <p>R Data Analysis Fundamentals paves way for further R Data Analytics modules. By grouping the R commands, it help learners understand the creation of data models to get analytics edge. .</p>	
Required Materials: Recommended Learning Resources.	Supplementary Materials: Lecture notes and tutor extra reading recommendations.
Special Requirements: The unit requires a combination of lectures, demonstrations, discussions, and hands-on labs.	
<p>Intended Learning Outcomes:</p> <ol style="list-style-type: none"> Understand the different types of arithmetic operators and the implementation in performing operators. Understand the use and data structures including different functions that can be used in vector, list, matrix, data frame and factor. Understand how to create, call, pass arguments and return function values; and the purpose of apply/vectorised function in R. Understand how to import and export two main data files; CSV and Excel and the differences between these file types. 	<p>Assessment Criteria:</p> <ol style="list-style-type: none"> Describe arithmetic operator symbols and meaning Demonstrate using comparison operators Explain the use of logical operators Describe assignment operators Explain purpose of membership and special purpose operators Define vector and demonstrate creating vectors. Explain indexing and subsetting. Explain different methods of subsetting a vector Be able to create a list Demonstrate modifying, adding, removing and combining lists Demonstrate how to create a matrix Describe matrix operations Demonstrate how to create a data frame Be able to combine, merge and modify data frames Demonstrate creating a factor Describe factor levels Demonstrate the purpose of creating and calling functions. Be able to pass arguments and return values. Describe the disadvantages of loops. Describe when to use apply() function. Describe when to use lapply() function. Explain the implementation of sapply() function. Describe the implementation of tapply() function Demonstrate how to read and write CSV or Excel files. Be able to read a file from web/internet. Be able to set column names. Demonstrate reading a specific range.

<p>5. Understand the R graphics plot()/ggplot2 function and the different options/arguments used for plot types, labels and colours.</p>	<p>4.5 Be able to write to a file</p> <p>5.1 Demonstrate creating a base plot.</p> <p>5.2 Describe barplot() parameters</p> <p>5.3 Demonstrate scatter plot syntax or parameter</p> <p>5.4 Define boxplot</p> <p>5.5 Describe hist() function and parameters</p> <p>5.6 Analyse pie() parameters</p> <p>5.7 Be able to create a Quantile-Quantile (QQ) plot</p> <p>5.8 Demonstrate ggplot2 graphics</p>
<p>Methods of Evaluation: A 3-hour essay written paper with 5 questions, each carrying 20 marks. Candidates are required to answer all questions. Candidates also undertake project/coursework in Introduction to R Data Analysis Fundamentals, with a weighting of 100%.</p>	

Recommended Learning Resources: Introduction to R Data Analysis Fundamentals

<p>Text Books</p>	<ul style="list-style-type: none"> • R for Data Analysis in easy steps - R Programming essentials by Mike McGrath. ISBN-13 : 978-1840787955 • Hands-On Programming with R by Garrett Grolemund. ISBN-13 : 978-1449359010 • R for Data Analysis by Scott McCoy ISBN-13 : 978-1943873036
<p>Study Manuals</p> 	<p>BCE produced study packs</p>
<p>CD ROM</p> 	<p>Power-point slides</p>
<p>Software</p> 	<p>R Studio</p>