Module Code	ZD-1201			
Module Title	Introduction to Data Analytics			
Degree/Diploma	Bachelor of Digital Science (Major in Data Science)			
Type of Module	Major Core			
Modular Credits	4	**Total Student Workload**	10	hours/week
		Contact Hours	4	hours/week
Prerequisite	Knowledge of computer programming			
Anti-requisite	ZD-2401 Introduction to Data Analysis and Visualization			

Aims

Students will learn the latest technologies in the field of data analytics. The module aims to accurately describe results and data-driven insights for research and industry.

Learning Outcomes

On successful completion of this module, a student will be expected to be able to:

Lower order:	20%	• understand various data pre-processing techniques • explore and explain a data set using basic visualization tools
Middle order:	30%	• perform statistical operations and visualization of data to conduct insightful analysis • interpret the results with valuable information • apply data wrangling with a programming language
Higher order:	50%	• write code to perform data wrangling operations • experiment with data visualization techniques for exploratory analysis • write programs to compare performance of various clustering algorithms • perform estimation and prediction analysis for univariate and multivariate data • develop a project to perform the complete pipeline of data analytics

Module Contents

- Data Pre-processing: Data Cleaning, Handling Missing Data, Graphical Methods for Identifying Outliers, Measures of Centre and Spread, Data Transformation
- Exploratory Data Analysis: Exploring Categorical and Numeric Variables, Exploring Multivariate Relationships, Deriving New Variables: Flag and Numeric Variables, Using EDA to Investigate Correlated Predictor Variables
- Univariate and Multivariate Statistical Analysis: Descriptive Statistics Measures, Statistical Approaches to Estimation and Prediction, Statistical Inference, Confidence Interval Estimation of the Mean and Proportion, Hypothesis Testing for the Mean and Proportion, Statistical tests (t-Test, Chi-Square, ANOVA), Simple and Multivariate Regression
- Data Visualization: Connecting to data, Dimension and Measure, Filtering and Sorting, Aggregation, Calculated Fields, Symbol Map, Trend Lines, Forecasting, Dashboard, Story
- Case Study using Visualization tool: Apply knowledge on real dataset and create a dashboard to present a story
- Introduction to Programming environment for data analytics:
  - Data Wrangling: Data Gathering, Data Cleaning, Data Assessing, Clustering
  - Data Visualization: Univariate, Bivariate and Multivariate Exploration
- Case Study: Apply knowledge to real world dataset and create slide deck

Assessment	Formative Assessment	Interactive Quizzes and Feedback
	Summative Assessment	Examination: 30%
		Coursework: 70% - Two Lab Tests (20%) - Six Class Tests (30%) - Project (20%)