



Centre for CONTINUOUS PROFESSIONAL DEVELOPMENT

Data Management and Analytics

(Certificate of Competence)

Note:

This course is currently not publicly but can be customised and offered on an in-house basis.

ENQUIRIES: ccpd@spu.ac.za

Course Duration	6 Weeks with a minimum workload of 15 hours per week
Entry level requirements and rules of admission	NSC or equivalent

Rationale for offering this course:

This short course provides students with the basic building blocks for a beginner data analysis which opens for participants looking to gain a competitive edge and be successful in a wide range of data analytics careers today and in the future. Data analytics is a field that offers adequate solutions to the current needs of the world.

Businesses have bigger data and need more advanced analysis, and the challenge includes capture, curation, storage, search, sharing, transfer, analysis, and visualization. There are growing demands of using data analytics to assist decision-making by using the potential value created from data via the combination of various tools, algorithms, and machine learning principles to discover hidden patterns from the raw data. This is further backed by the increase in the number of South African universities which have special departments for teaching data analytics. There is a need to note that every organization needs data analytics, and this increases the need for individuals to have these skills as it provides an opportunity for self-employment.

This course will benefit employees from both the Private and Public sector, with or without a prior qualification who want to upgrade their data analytics skills without necessarily entering a formal diploma/degree programme. SMME owners will also benefit from this course – enabling them to analyse the performance of their businesses.

COURSE OVERVIEW:

Course Content	Brief description of course content: • What is Data Analytics In this topic, students will study the various types of data analysis and therefore the key steps during a data analysis process. Gain an understanding of the various components of a contemporary data ecosystem, and therefore the role Data Engineers, Data Analysts, Data Scientists, Business Analysts, and Business Intelligence Analysts play during this ecosystem. Students will also study the role, responsibilities, and skillsets required to be a Data Analyst. • The Data Environment In this topic, students will study the various sorts of data structures, file formats, sources of knowledge, and the languages data professionals use in their day-to-day tasks. Gain an understanding of varied sorts of data repositories like Databases, Data Warehouses, Data Marts, Data Lakes, and Data Pipelines. additionally, study the Extract, Transform, and Load (ETL) Process, which is employed to extract, transform, and load data into data repositories. Gain a basic understanding of massive Data and large processing tools like Hadoop, Hadoop Distributed filing system (HDFS), Hive, and Spark. • Gathering and Wrangling Data Under this topic, students will learn about the process and steps involved in identifying, gathering, and importing data from disparate sources. You will learn about the tasks involved in wrangling and cleaning data to make it ready for analysis. In addition, students will
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	gain an understanding of the different tools that can be used for gathering, importing, wrangling, and cleaning data, along with some of their characteristics, strengths, limitations, and applications. • Mining & Visualizing Data and Communicating Results In this topic, students will study the role of Statistical Analysis in mining and visualizing data. Study the varied statistical and analytical tools and techniques to realize a deeper understanding of your data. These tools assist students to know the patterns, trends, and correlations that exist in data. Furthermore, students will study the varied sorts of data visualizations that will assist to communicate and tell a compelling story together with your data. Gain an understanding of the various tools which will be used for mining and visualizing data, alongside a number of their characteristics, strengths, limitations, and applications. • Data Analysis and Career Prospects In this topic, students will study the various career opportunities within the field of Data Analysis and therefore the different paths of getting skilled as a data Analyst. At the top of the topic, students will demonstrate an understanding of a few of the essential tasks involved in gathering, wrangling, mining, analyzing, and visualizing data.
Specific Outcomes	
What is Data Analytics?	Outcome 1: By the end of this module the students should be able to: • Study the various types of data analysis and the key steps during a data analysis process. • Gain an understanding of the various components of a contemporary data ecosystem • Understand the role Data Engineers, Data Analysts, Data Scientists, Business Analysts, and Business Intelligence Analysts play in data analytics. • Understand the role, responsibilities, and skillsets required to be a Data Analyst.
The Data Environment	Outcome 2: By the end of this module the students should be able to: • Know the various types of data structures, file formats, sources of data, and the languages data professionals use in their day-to-day tasks. • Gain an understanding of various types of data repositories like Databases, Data Warehouses, Data Marts, Data Lakes, and Data Pipelines. • Understand the Extract, Transform, and Load (ETL) Process, which is employed to extract, transform, and load data into data repositories. • Gain a basic understanding of massive Data and large processing tools like Hadoop, Hadoop Distributed filing system (HDFS), Hive, and Spark.

Gathering and Wrangling Data	Outcome 3: By the end of this module the students should be able to: • Learn about the process and steps involved in identifying, gathering, and importing data from disparate sources. • Learn about the tasks involved in wrangling and cleaning data to make it ready for analysis. • Gain an understanding of the different tools that can be used for gathering, importing, wrangling, and cleaning data, along with some of their characteristics, strengths, limitations, and applications
Mining and Visualising Data and Communicating Results	Outcome 4: By the end of this module the students should be able to: • Know the role of Statistical Analysis in mining and visualizing data. • Understand the varied statistical and analytical tools and techniques to realize a deeper understanding of your data. These tools assist students to know the patterns, trends, and correlations that exist in data. • Understand the various types of data visualizations which will assist you to communicate and tell a compelling story together with your data. • Gain an understanding of the various tools which will be used for mining and visualizing data, alongside a number of their characteristics, strengths, limitations, and applications.
Data Analysis and Career Prospects	Outcome 5: By the end of this module the students should be able to: • Know the various career opportunities within the field of Data Analysis and therefore the different paths of getting skilled as a data Analyst. • Demonstrate understanding of the essential tasks involved in gathering, wrangling, mining, analyzing, and visualizing data.
Teaching and Learning Strategies	• Lectures (face-to-face or online): A lecture is normally a presentation or demonstration designed to give an overview of a topic. • Independent study: Students will be expected to take responsibility for learning and need to manage time effectively to fit this around the academic timetable and any other activities. • Practical learning: Students may be asked to work independently, in pairs, or as part of a small team to submit a piece of work that will count towards their overall assessment. • Individual/group project: Students will be presented with real-life problems/case studies to work with. • An essential part of the learning activities would be to engage the participants using strategies such as peer learning, group discussions and the flipped classroom.