

MODULE DESCRIPTIONS

CAPSTONE PROJECT

The purpose of this module is to solve an industry-specific problem using one of the algorithms used in this course. The student must use all skills taught during the first and second trimester to gain an industry-specific understanding of the problem, the nature of the data, prepare the data, select an appropriate algorithm to train, fit, evaluate and re-evaluate the effectiveness of the model. The final product must be ready for use in industry. The student will gain an understanding of professional report writing and the skills needed to present processes and outcomes to executive management.

DATA SCIENCE 1

The purpose of this module is to teach the learner to practically apply logistic regression, support vector machine and decision tree problems. The student will learn to build, fit, train, evaluate and interpret models using these algorithms. Students will also learn to prevent common problems related to overfitting.

DATA SCIENCE 2

The purpose of this module is to teach the learner to apply neural networks practically. KMeans Clustering and Hierarchical clustering. The student will learn to build, fit, train, evaluate and interpret models using these algorithms. Students will also learn to prevent common problems related to overfitting with Neural Networks.

DATA SCIENCE IN FINANCE

This module is suitable for students who are interested in a career as a data scientist in the Finance industry. Students will be introduced to the type of data used in Finance, one of the areas in Commerce that deals specifically with large amounts of data. Students will be exposed to practical examples of day-to-day applications of data science in finance, like risk analytics and management, customer experience and management, consumer analytics and segmentation, personalised services, pricing automation, fraud detection, sentiment analysis, algorithmic trading, real-time analytics, predictive and forecasting analytics, etc. They will also develop an understanding of the general responsibilities of a data scientist in the finance sector. Lastly, they will learn to use suitable techniques to identify key problems and suggest data-driven solutions.

DATA SCIENCE IN HEALTH

This module is designed for students interested in applying data science within the healthcare and health informatics sectors. Students will be introduced to the structure of healthcare systems, the nature of health data, and the role of data science in improving healthcare delivery, patient outcomes, and operational efficiency. The module explores practical applications such as disease prediction, patient risk stratification, medical imaging analysis, public health surveillance, and healthcare resource optimisation. Students will also gain an understanding of ethical, legal, and regulatory considerations specific to healthcare data, including privacy, security, and governance in the South African and global context.

DATA SCIENCE IN MARKETING

The purpose of this module is to provide the student with an understanding of how to use data science tools and software to enable businesses to market their products/services better. Students will first gain knowledge of Marketing in general and Digital Marketing in particular, and then delve into data science tools used in/for Marketing. At the end, students will be exposed to contemporary case studies.

INTRODUCTION TO DATA SCIENCE AND STATISTICS

The purpose of this module is to provide the learner with foundational knowledge necessary for Data Science tasks. This module provides the learner with the basic tools and knowledge for what will be needed in the second and third trimester. The learner will be introduced to basic algorithms, descriptive and inferential statistics as well as common data Science algorithms.

WORKING WITH DATA

The purpose of this module is the provision of analytical tools for learners to read, prepare, manipulate and explore data. Data must be well understood and prepared before being fed into algorithms for further investigation and before statistical learning can take place. Students will be introduced to various statistical and mathematical tools for data reading and manipulation as well as graphical tools for data exploration. Lastly, the importance of ethics in the data realm will be highlighted.