Bachelor of Data Analytics in Fintech

Unit Description

Applied Statistics

This unit considers select topics from experimental design and survey methods, descriptive statistics, hypothesis testing and modelling for continuous and categorical variables. Throughout the unit, advanced statistical software will play an important role in data visualisation and analysis. Students will consider topics through the presentation of real research problems from a number of disciplines, gaining valuable experience in the application of statistics in a variety of contexts, including a project simulating statistical problems commonly encountered in the workplace.

Big Data and Data Science

The objectives of this unit are to introduce students to an understanding of data, uncover patterns within data, and develop models whose prediction accuracy on future unknown data can be quantified. Major topics include: concepts of statistical learning; machine learning algorithms; over-fitting and model tuning; regression models; classification models; recommendation engines and social networks; assessing model performance; and extracting meaning from data. The R programming language and software environment will be introduced to students and will be used to demonstrate implementations.

Business Analytics

This unit helps students to understand how business analytics can guide and inform business decisions. In particular it focuses on developing one's ability to collect the data, analyse it and to use the results of analysis in practice. Workshops of this course are very practical and help students to develop analytical skills and to be able to work on various business analysis tasks. Finally, this unit offers students challenging but exciting opportunities to enhance their business management skills, work collaboratively and creatively.

Commercial Banking

This unit provides an overview of the functions and objectives of commercial banking operations. Topics include assets, liability and liquidity management; interest rate management and bank lending instruments. Derivative securities salient to financial intermediation, loan commitments and securitisation will also be examined.

Corporate Finance

This unit develops the study of the role of quantitative analysis in facilitating personal and corporate financial decisions. The principal focus of the unit is the student's knowledge of finance, especially in relation to investment decision making for the corporate financial manager. Major topics include the valuing of debt and equity securities; the evaluation and selection of investment projects; the capital asset pricing model; Australian financial market; dividend policy and capital structure; and working capital management.

Databases

This unit focuses on database design, implementation and management. Topics include data modelling, database administration, logical and physical database design, non-relational databases, recovery, relational model, security, standard query language (SQL) and transaction management. The theory material is complemented by practical work using common database management systems.

Information Security Policy and Governance

This unit covers the advanced study of information security policy and governance at an organisational level. Students will gain an understanding of standards and policies, as well as the international, national and local regulatory requirements governing organisational information technology systems. The unit will address relevant data protection legislation, industry best practices and risk management techniques.

It will also teach the necessary skills to evaluate and measure organisational compliance and to determine the appropriate organisational strategy to best support its information security needs.

Intelligent Systems

This unit offers an introduction to the fundamental concepts and techniques of artificial intelligence (AI), focusing on expert systems to solve engineering problems, data mining, data analysis for industries and intelligent agents in computer games. Topics include fuzzy logic, genetic algorithms, intelligent agents, introduction to artificial intelligence and applications, introduction to game AI, neural computing, rule-based expert systems, state machines and methods of evaluating these technologies.

Introduction to ICT Research Methods

This unit provides an introduction to research in the information and communications technology (ICT) discipline. It explores the kinds of research questions addressed in ICT research and provides an opportunity for students to understand the broad range of research approaches used in ICT research including action research, case study research, design research, experimental research and survey research.

Students will develop both research and project management skills, and gain the knowledge and skills needed to critically evaluate the ICT research literature.

Machine Learning

The objective of this unit is to introduce important concepts in machine learning and important algorithms in this field. Topics include classification and clustering algorithms, data pre-processing, ensemble learning, hyperparameter tuning, linear and logistic regression, model evaluation, neural networks and deep learning.

Application examples are taken from areas such as medical decision-making, sentiment analysis and computer vision. Students will learn how to design and implement machine learning and deep learning models for data analysis using Python.

Principles of Computer Science

This unit is designed to develop problem-solving and programme design skills by using an object-oriented programming language. Major topics include algorithm design, procedural abstractions, use of libraries as collection of black-box code modules, the concepts of pre- and post-conditions, strings, arrays, an introduction to object-oriented concepts including data abstraction, encapsulation, classes and object references, inheritance, introduction to recursion, streams and file input and output, and the definition and use of common classes — lists, stack and queues.

Security Architectures and Controls

This unit teaches computer and information technology security in detail from an architectural perspective. That is, not only are the different layers, mechanisms and components that operate to provide a secure computing environment reviewed in detail, but the groupings, similarities, and interrelationships between these are analysed. The aim of the unit is to provide students with a solid understanding of computer security architecture components and controls, and how they work in combination at the various architectural layers.

Statistical Data Analysis

This unit introduces students to data collection methods and statistical analyses common in the life and health sciences. Topics include analysing relationships between variables, comparing measurements or proportions between groups, describing and comparing data distributions, nonparametric methods, probability and sampling distributions, sampling methods, statistical inference foundations (estimation and hypothesis testing), and summarising data with numbers and graphs. Throughout the unit, students will use statistical software, interpret its output and report their conclusion.

The Search for Everything: Data Analytics and Storytelling in the 21st Century

Data analytics is present in every moment of our lives. Data flows through smart phones, smart cars, smart fridges, streaming services, social media, loyalty programs, business operations, logistics, leisure, and entertainment like a current shaping everything.

At the heart of comprehensive data collection and analysis is a quest to understand ‘everything’, and this unit invites students into the multi-layered data-driven world where the real and the digital meet.

This unit teaches you how to clean, manipulate, interpret, and transform data into creative visualisations using Microsoft Excel, to tell data-driven stories for invested stakeholders. You will examine the impact of data analytics in the context of public and private life; professional, political, and societal domains; and the reach of data across local, national, and global contexts.

In hand with foundational data skills, this unit explores ethical issues relating to data surveillance, the implications of data mining on human behaviour, and the analytics machines central to the functioning of big tech platforms such as Google, Amazon, and Facebook.