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|--------------------------------|--------|------------------------------|-------|--|----------|---|
| School | Course | Course_code | Unit | Unit_code | Outcomes | Overview |
| 1 | monash | Master of Data Science | C6004 | FIT9132 - Introduction to databases | FIT9132 | <p>Apply the theories of the relational database model;\ Develop a sound relational database design;\ Implement a relational database based on a sound database design;\ Manage data that meets user requirements, including queries and transactions;\ Contrast the differences between non-relational database models and the relational database model.</p> <p>This unit will introduce the concept of data management in an organisation through relational database technology. Theoretical foundation of relational model, analysis and design, implementation of relational database using SQL will be covered.</p> |
| 2 | monash | Master of Data Science | C6004 | FIT9136 - Algorithms and programming foundations in Python | FIT9136 | <p>Apply best practice Python programming constructs for solving computational problems;\ Restructure a computational program into manageable units of modules and classes using the object-oriented methodology;\ Demonstrate Input/Output strategies in a Python application and apply appropriate testing and exception handling techniques;\ Investigate useful Python packages for scientific computing and data analysis;\ Experiment with data manipulation, analysis, and visualisation technique to formulate business insight.</p> <p>This unit introduces the Python programming and the basics of data structure and algorithms including their design, analysis and implementation in Python. Students will experience working with Python implementation of data structures and algorithms widely used in modern programming language to solve simple problems. Topics covered in this unit are 🔍 For more content click the Read more button below.</p> |
| 3 | monash | Master of Data Science | C6004 | FIT9137 - Introduction to computer architecture and networks | FIT9137 | <p>Describe basic concepts of computer hardware and software architectures;\ Explain the three major functions of an operating system (OS), namely, process management, memory management, and file management;\ Analyse and formulate the functions and architectures of (wireless) local area networks, wide area networks and the Internet;\ Examine networks using the underlying fundamental theories, models and protocols for data transmission;\ Use the fundamental concepts of cybersecurity in the Internet, including identifying common threats and applying countermeasures.</p> <p>This unit introduces students to fundamentals of computer systems, with a focus on two modules: Module 1 (computer architecture and modern operating systems) and Module 2 (networking technology). Module 1 covers: CPU, memory, storage and peripherals; and operating system basics. Module 2 covers: TCP/IP layered protocols; WAN and LAN networking 🔍 For more content click the Read more button below.</p> |
| 4 | monash | Master of Data Science | C6004 | MAT9004 - Mathematical foundations for data science and AI | MAT9004 | <p>Use trees and graphs to solve problems in computer science;\ Apply counting principles in combinatorics;\ Describe the principles of elementary probability theory, evaluate conditional probabilities and use Bayes' Theorem;\ Demonstrate basic knowledge and skills of linear algebra, including the manipulation of matrices, solution of linear systems, and evaluate and apply determinants;\ Explain fundamental concepts in calculus including basic differentiation and integration, and composite, inverse and parametric functions;\ Perform key skills in the calculus of functions of several variables including the calculation of partial derivatives, find tangent planes and identify stationary points, root findings and convexity for optimisation.</p> <p>Mathematical topics fundamental to computing and statistics including trees and other graphs, counting in combinatorics, principles of elementary probability theory, linear algebra, and fundamental concepts of calculus in one and several variables.</p> |
| 5 | monash | Master of Data Science | C6004 | FIT5125 - IT research methods | FIT5125 | <p>Review and critique research literature (from a wide range of sources), research designs and research findings in a sub-discipline of IT;\ Communicate research findings orally and in writing, online and using video, in research and industry settings;\ Explain the ethical and professional issues that may arise in IT research and demonstrate them in practice;\ Identify and explain major research philosophies and paradigms;\ Evaluate, select and justify research methods and techniques of data collection and analysis appropriate to particular research designs and projects in sub-disciplines of IT;\ Analyse and describe the technical, professional and socio-economic contexts that motivate research, and the implications of research outcomes;\ Design and carry out a rigorous and ethical research project and produce a report explaining the project, its design and interpretation of the results;\ Apply research skills to operate effectively as a member of a research project team.</p> <p>The aim of the unit is to prepare Masters students to conduct research across the range of IT sub-disciplines. It provides broad coverage of the issues, concepts, methods, and techniques associated with Computer Science, Software Engineering, Information Systems and Information Management research. It introduces students to major research paradigms, the 🔍 For more content click the Read more button below.</p> |
| 6 | monash | Master of Data Science | C6004 | FIT5145 - Data Introduction to data science | FIT5145 | <p>Analyse the role of data in organisations, including curation and management issues;\ Apply basic tools for performing exploratory data analysis and visualisation;\ Apply basic tools for managing and processing big data;\ Apply basic predictive modeling and data analysis methods;\ Determine data storage and processing requirements for a data science project;\ Identify data resources and standards.</p> <p>This unit looks at processes, case studies and simple tools to understand the many facets of working with data, and the significant effort in Data Science over and above the core task of Data Analysis. Working with data as part of a business model and the lifecycle in an organisation 🔍 For more content click the Read more button below.</p> |
| 7 | monash | Master of Data Science | C6004 | FIT5147 - Data exploration and visualisation | FIT5147 | <p>Perform exploratory data analysis using a range of visualisation tools;\ Describe the role of data visualisation in data science and its limitations;\ Critically evaluate and interpret a data visualisation;\ Distinguish standard visualisations for qualitative, quantitative, temporal and spatial data;\ Choose an appropriate data visualisation;\ Implement static and interactive data visualisations using R and other tools.</p> <p>This unit introduces statistical and visualisation techniques for the exploratory analysis of data. It will cover the role of data visualisation in data science and its limitations. Visualisation of qualitative, quantitative, temporal and spatial data will be presented. What makes an effective data visualisation, interactive data visualisation, and creating data 🔍 For more content click the Read more button below.</p> |
| 8 | monash | Master of Data Science | C6004 | FIT5196 - Data wrangling | FIT5196 | <p>Parse data in the required format;\ Assess the quality of data for problem identification;\ Resolve data quality issues ready for the data analysis process;\ Integrate data sources for data enrichment;\ Document the wrangling process for professional reporting;\ Write program scripts for data wrangling processes.</p> <p>This unit introduces tools and techniques for data wrangling. It will cover the problems that prevent raw data from being effectively used in analysis and the data cleansing and pre-processing tasks that prepare it for analytics. These include, for example, the handling of bad and missing data, data integration and 🔍 For more content click the Read more button below.</p> |
| 9 | monash | Master of Data Science | C6004 | FIT5197 - Statistical data modelling | FIT5197 | <p>Perform exploratory data analysis with descriptive statistics on given datasets;\ Construct models for inferential statistical analysis;\ Produce models for predictive statistical analysis;\ Perform fundamental random sampling, simulation and hypothesis testing for required scenarios;\ Implement a model for data analysis through programming and scripting;\ Interpret results for a variety of models.</p> <p>This unit explores the statistical modelling methods that underlie the analytic aspects of Data Science and Machine Learning. By working through examples, this unit gives a strong mathematical and statistical foundation to enable a deeper understanding of data analysis and machine learning methods taught in later MDS/MAI units which focus 🔍 For more content click the Read more button below.</p> |
| 10 | monash | Master of Data Science | C6004 | FIT5149 - Applied data analysis | FIT5149 | <p>Analyse data sets with a range of statistical, graphical and machine-learning tools;\ Evaluate the limitations, appropriateness and benefits of data analytics methods for given tasks;\ Design solutions to real world problems with data analytics techniques;\ Assess the results of an analysis;\ Communicate the results of an analysis for both specific and broad audiences.</p> <p>This unit aims to provide students with the necessary analytical and data modeling skills for the roles of a data scientist or business analyst. Students will be introduced to established and contemporary Machine Learning techniques for data analysis and presentation using widely available analysis software. They will look at a 🔍 For more content click the Read more button below.</p> |
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