COURSE SYNOPSIS

CORE COURSES

MCSD1013 Business Intelligence and Analytics

Business intelligence and analytics refers to the solutions implemented by enterprises such as businesses, non-profits and governments using data to gain insights for making better decisions. Business intelligence and analytics is applied in operations, marketing, finance and strategic planning among other functions. The ability to use data effectively to drive rapid, precise and profitable decision has been critical strategic advantages for companies. With the increasing availability of broad and deep sources of information-so called "Big data"-business intelligent and analytics are becoming an even more critical capability for enterprises of all types and all sizes to identify trends and understand the information that can drive business change and support sustained successful business practices.

MCSD1043 Research Design and Analysis in Data Science

This course will cover the fundamental steps and implementation on developing the initial ideas to formal academic writing accordingly. Students will be given the mechanisms on how to transform and digest the literature reviews that leads to the proposed title. The theoretical and practical aspects of implementing draft project proposal will be the milestones of this course. Ordered, Critical and Reasoning Exposition of knowledge through student efforts.

MCSD1053 Data Science Governance

Data governance is a mandatory requirement for a successful organization which aims to be data driven, achieve master data management, build business intelligence, improve data quality or efficiently manage documents. This course provides an overview of the data governance life cycle. Students will learn why data governance is needed, how to design, initiate, and execute a program and how to keep the program sustainable. The governance in the aspect of big data will be explored for the best practice in managing and manipulating large amount of data. At the end of the course, students should be able to understand the design and the implementation of data governance and its importance to an organization.

MCSD1113 Statistic for Data Science

This course provides a fundamental concept in statistics for data science. Students will learn statistical inference including estimation, hypothesis testing and nonparametric tests. Further, students will be introduced to Bayesian inference, linear regression and classification. R will be used to apply these statistical methods. At the end of the course, students should be able to apply the statistical methods to real large data sets.

MCSD1123 Big Data Management

This course provides a basic fundamental of big data architecture and management. Students will learn the big data processes and the current big data technologies that are available. Further, students will be exposed to the big data platform ecosystem for big data manipulation. The big data management will be explored for the best practice in managing and manipulating large amount of data. At the end of the course, students should be able to understand the architecture and management of big data and also can develop simple application of big data handling using particular platform in assignment.

MCSD2123 Massive Data Mining and Streaming

This course aims to introduce students to basic principles and methods of machine learning algorithms that are typically used for mining large data sets. This course also will provide students with the skill and knowledge to build system and capable of analyzing huge amount of data. It explains the principle of distributed file systems and shows map reduce as a tool

for creating parallel algorithms. Typically, it covers the algorithms that used for analyzing networks, fundamental principles of techniques such as decision trees and support vector machines and finally neural network architecture. The students will gain practical understanding through a coding exercise where they will implement and apply one machine learning algorithm on a particular large dataset.

MCSD2213 Advanced Analytics for Data Science

This course provides a basic yet solid understanding on the use of analytics approach in the examination of data or content to discover deeper insights and make predictions using sophisticated techniques and tools on real world problems. Students will learn descriptive analytics using analytics tools to gain insight into the past. Students will also acquire understanding of predictive analytics using statistical and machine learning techniques to understand future outcome. The prescriptive analytics provides knowledge in simulation and optimization to quantify the effect of future decision to advise possible outcomes before decision is made. The analytical abilities to be acquired by students in this course are to reliably select analytic techniques or method and specify steps involve in the analysis process for descriptive and predictive analysis. At the end of the course, students should be able to apply the knowledge on analytical techniques or tools in real world problems to be able to make an informed decision through analytical interpretations of results.

ELECTIVE COURSES

MCSD1103 Data Visualization

This course is an introduction to the principles and techniques for visualization to transform and visualize the large datasets to aid knowledge discovery and decision-making. Students will learn the principles, techniques, and practical skill necessary to communicate information about data clearly and effectively through data visualization. Further, students will expose to techniques for visualizing different types of data including categorical, time series, spatial, and multiple variables data. Additionally, students will utilize available tools to visualize the dataset. At the end of the course students should be able to implement and apply the theory and use tools to communicate information out of the data clearly and effectively through graphical means.

MCSD1133 Operational Research and Optimization

The aim of the course is to introduce students to some applications of data science that can be formulated and solved by operational research and optimization techniques. Students will learn the theory and how to practice it for modeling (formulate, analyze and solve) optimization problems arising in data intensive environments. Further, students will be exposed to use appropriate operational research or optimization software such as R programming, Python to solve formulated data science problem. At the end of the course, students should be familiar with literature of operational research and optimization for data science.

MCSD1143 Supply Chain Analytics

The course aims to improve operational efficiency and effectiveness by enabling data-driven decisions at strategic, operational and tactical levels. The student will able to perform analysis using data analytics methods and analytical tools necessary in the areas of predictive, descriptive and prescriptive analytics to efficiently manage demand and supply networks. Through the analysis and discussion of case studies they will discover business insights in order to optimize the value of supply chain processes and operations. The topics covered including designing the supply chain network, planning demand and supply in a supply chain, retail analytics, inventory management and transport analytics. Software packages such as R, Python and Tableau will be utilized.

MCSD1153 Human-based Computing

This course offers students a new perspective on the study of human biological systems to human computing system. This course will emphasis on the theoretical of human computing aspect which includes dendrite, immune, membrane and cell computing. The fundamental concept of this course will be designed to come out with algorithmic computing based for solving complex meta data in chaotic environment.

MCSD1163 Big Data Computing
This course is designed to be suitable for an introductory course at master levels. This course covers intensive exploration on GPU computing with CUDA programming. The foundations of the CUDA programming will be addressed in terms of the concept, design, architecture and programming model to deal with the needs of big data computing. Students will also be exposed to the current needs of big data era in which the big data computing accessory will be given especially on the implementation of high-performance computing in executing GPU Machine Learning Library (GPUMLib).

UNIVERSITY COURSES

UCSM1263 IT Project Management
This course presents a hands-on perspective to Information Technology Project Management. This course will assist postgraduate students to plan and implement their postgraduate projects as well as other IT projects effectively. The subject is organized into three main sections, that covers I) Basic concepts, life cycle and framework of project management II) Detailed description of each project management knowledge areas under the Project Management Institute (PMI) Body of Knowledge (PMBOK) and its applications, and III) Real Project Initiation, Planning, Executing, Monitoring and Closing. The Project Management areas include – project integration, scope, time, cost, quality, human resource, communications, risks and procurement management. Students are expected to perform real projects with teams and achieve agreed Key Performance Indicators (KPI).

UHAP6013 Seminar on Global Development, Economics and Social Issues
Discussion on this subject includes issues related to globalization and development, economic and social crisis that has become a global concern. It aims in developing skills in understanding and analyzing global issues and recommending relevant solutions. Issues will be discussed in detail.

UHAW6023 Philosophy of Science and Civilization
This course contains two sections. This subject discusses the world view of its role and importance in the formation of a living culture and civilization; The concept of revelation, knowledge, humanity, nature and happiness; Comparative Study in Philosophy of Science: Epistemology, Ontology and Axiology in education. Discussion on current issues and challenges, among others; civilizational challenges between the West and the East; Development and the environment; Economy and trade; State Administration and management; Scientific research; Communications and information technology; Ethics and morals; Crime and terrorism; Family education

UHAZ6123 Malaysia Society and Culture
This course is designed for international postgraduates from countries of non-Malay origins. Students will be exposed to various aspects of the Malaysian culture such as belief system, religious festivals, customs and etiquettes of different ethnic groups in Malaysia. Emphasis will be given to the Malay culture as it makes the core for the *Dasar Kebudayaan Kebangsaan*. Students will also be briefly introduced to basics of Malay language as the national language of Malaysia.

MASTER PROJECT

MCSD6215 Master Project 1
This is the initial part of a 2-part Master project that every student must fulfill successfully. Students are required to propose a suitable research topic under the supervision of a lecturer as a supervisor. Students must meet regularly with supervisor who will monitor their continuous progress. At the end of this course, students are required to prepare a report and present their proposal.

MCSD6227 Master Project 2
This is the second part of a 2-part Master project that every student must fulfill successfully. In this phase, students are required to execute the next phases of their development plan from Part 1 (Project 1). Students are now required to code and integrate the different modules that make up the proposed project. Students will test the developed modules and the final fully-integrated project following programming code development and research testing practices. Students must meet regularly with supervisor(s) who will monitor their continuous progress. Students are required to prepare a report and present their final work.