

Dept. of Data Science

The objective of the Department of Data Science is to enhance professional competence on the basis of sharpen understanding of management, data science, and statistics in turbulent management environment. The curriculum consists of three parts: (1) understanding management theories such as management strategy, business processes, and organization management, (2) acquiring analytics and quantitative methods to complex problems in all areas of business including finance and accounting, and (3) applying fundamental skills and knowledge of business analytics and statistics in a modern organization for improving competitive advantage of companies. We provide a variety of opportunities to students for keeping balance management theory with practical experience via lecture on management principles, practical tutorials, industry-university cooperation through strategic alliance with leading companies in business analytics and data science industries.

Students can differentiate themselves with general knowledge on management disciplines and specialized knowledge on business analytics and statistics. After graduation, the students are expected to be a professional data scientist, business and IT analysts, consultants in business and IT, and general manager in all business areas including finance, accounting, and marketing.

Data Science Major

The goal of Data Science Major is designed to provide an understanding of management, data science, statistics and how business analytics is used for management decisions in organizations. Students will be exposed to a theoretical foundation on management, business analytics, and statistics disciplines. Application of these theories to the success of organizations and to the roles of management, IS professionals, and business analyst will also be presented. This major trains students in the quantitative skills needed for analyzing large-scale data as social media data and real-time and historical data to create more efficient business processes and more accurate decision making, and building more effective business models. Skills taught include statistics, operations research methods, database, data mining, and social mining.

Courses

Core Courses

·Introduction to Data Science (3)

This course overviews the multidisciplinary aspects of data science, including business, statistics, and computer science. It introduces basic theories and

techniques for decision makers to make effective business decisions drawing on data analytics.

•Business Statistics (3)

This course covers mathematics and statistics relevant to management. The topics may include linear algebra, descriptive statistics, etc.

•Database Management (3)

This course introduces the basic concepts of database design and data management based on the relational data model. Topics include normalization, relational query language, the Entity-Relationship model, and implementing a database using a personal DBMS such as MS Access.

□ **Data Science Major Courses**

•Multivariate Statistical Analysis (3)

This course provides an introduction to multivariate statistics. This course will cover multivariate ANOVA and principal components analysis (PCA), multidimensional scaling (MDS), factor analysis and clustering. This course will then study canonical correlation, discriminant analysis, and structural equation modeling or other topics of interest to the students. The course is a mix of theory and hands on application to data.

•Data Mining (3)

This course handles the principles and theories of data mining which is essential when looking at the realization of business intelligence. The course is designed to have both theoretical study and practical experiences, and the theoretical study looks at the basics of data mining and various methodologies. In the practice sessions, students are expected to build experience in information gathering and mining through using most widely used business software.

•Business Service Analysis (3)

This course teaches the basic knowledge about services such as its concept, role, and competitive strategy, and educates theories and practices related to general service management including service design, service quality, service techniques, supports, service operations, service company's growth and global strategies, etc.

•Big Data Distributed Processing (3)

This course provides basic concepts and usage of sourcing and storing big data across a firm. In addition, this course prepares the students for fundamental understanding and monitoring a quality of big data.

·**EDA and Big Data Visualization (3)**

This course introduces EDA(Exploratory Data Analysis)-type techniques to find out the structure and characteristic of data, focusing on visualization methods to summarize big data.

·**Linear Statistical Analysis (3)**

This course is intended to introduce students to generalised linear modelling methods for both discrete and continuous data.

·**Social Network Analysis (3)**

The course offers insights to the concept and fundamentals of analytic techniques of social network. Through the analytic studies and software, students can grasp the real cases of how social network has affected the management and information system.

·**Text Mining and Social Analytics (3)**

This course teaches the basic skills of social media data mining including text mining. Students will learn how to derive business insight through social data analytics.

·**Big Data Integration and Modeling (3)**

This course provides foundation level knowledge that enables effective understanding of big data analytics. It will provide many opportunities for students to address a big data analytics challenge by applying the concepts taught in this class.

·**Business Optimization and Simulation (3)**

In this course, students learn how to develop and analyze strategies by using a variety of techniques from many disciplines including Management Science, Finance, and Accounting.

·**Business Insight and Decision Making (3)**

This course educates decision making procedure and strategy based on decision trees, sensitivity analysis, expected utility models, multi-criteria decision making, game theory.

·**Research Methods for Business (3)**

In this course, students learn about how to scientifically collect, modify, process, store, and distribute business data and information.

·**Big Data Project (3)**

This course is designed to provide experience of data science process ranging from data collection to usage. This course makes students to apply theories and techniques to real-life case, leading to improved understanding of data science

·Finance Analytics (3)

Basic corporate finance models, data stratfication tools, and predictive modelling will be introduced to improve decision making in business environment based on financial data.

·Research Ethics & Thesis Study (3)

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

·R-Programming (3)

This course fully covers the basic programming language R. Using a variety of R package such as Rcommender, Rattle, Red-R, Rstudio, Rexcel, data analysis including data structure, input and output processing, basic programming, matrix, graphics will be taught.

·Operation Analytics (3)

Students will develop an understanding of operational process and study various data mining and data aggregation tools to increase efficiency and reduce cost.

·Marketing Analytics (3)

This course covers various data analysis tools to improve marketing decision. Topics include marketing theory, target positioning, and strategy for creating market value and brand concept.

·Business Model & Strategy (3)

This course introduces concept, classification, components, development methodology and various cases for business model. Based upon the understanding of business model, students can practice building business strategy with theory and business cases.

· Current Trends in Information Technology (3)

This course provides a broad issues of information and communication technology for Business Analytics in data management, graphics, application packages, and so on to improve capability of data analysis.

· Analysis of Statistic Data (3)

In this course, students learn about fundamental research approach to analyze data by

using statistical techniques, including basic theories, application of statistical analysis software, data collection, and interpretation of results. Research methodology is also lectured for writing thesis.

·Research Seminar in Data Science (3)

This seminar is prepared to educate new trends, issues and techniques of business analytics with discussion, presentation, special lectures by field experts.

·Introduction to e-Business (3)

Regarding the current and future e-business environments, this course covers how and why various e-business models survive or perish. Its goals are to: 1) provide the basic understanding of value proposition underlying the business model, 2) understand management issues such as key logistics, organizational and financial aspects, and 3) understand technology enablers such as IT technology.

·Management Information System (3)

This course examines the significance and evolution of the MIS field as an academic discipline. Students also learn various subjects regarding MIS such as the concepts and structures, planning, development, operation, evaluation, and control of information systems.

□ **Faculty Members**

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