

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.

•**Statistical Models and Application (3)**

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

•**Introduction to Machine Learning (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.

❑ **Data Science Major Courses**

•**Text 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.

•**Social Media Analytics (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.

•**Introduction to Deep Learning (3)**

This course introduce deep learning methods including artificial neural networks, deep neural networks, convolutional neural networks, and recurrent neural networks. Students learn the basic theories and practice to implement the algorithms in order to solve business problems.

•**Deep Learning Applications (3)**

In this course, students learn the latest techniques in the deep learning framework such as reinforcement learning and generative adversarial networks. With focus on both theory and practice, this course covers advanced deep learning models for various applications.

•**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.

•**Machine Learning Project (3)**

In this course, students will explore the latest research trends of machine learning methodologies for big data analysis and practice to implement it to real world data.

•**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

•**Case Study on Data Science (3)**

In this course, students are expected to explore the modern data analytics techniques to analyze big data including supervised and unsupervised learnings.

•**Multivariate Statistical Analysis (3)**

This course provides an introduction to multivariate statistics. It 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.

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

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

•**SQL and Data Warehouse (3)**

To learn how to model and analyze various techniques for analyzing big data and to get effective results. Also introduces and learns visualization principles of management data and actual design related issues. Through this, we define core analysis that has a direct impact on the competitiveness of the company and develop the ability to continuously maintain and strengthen the enterprise value through visualization of these core analysis.

•**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.

• **AI Big Data Analytics Planning (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.

•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 some 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.

•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.

•Big Data Wrangling & 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.

•Geospatial Big Data Analytics (3)

This course introduces and learns the principles of visualization of big data and actual design issues. Students will develop spatial big data analysis capabilities for enhancing companies' competitive advantage by learning big data visualization programs to efficiently visualize and analyze spatial big data.

•Visual AI (3)

This course provides opportunities to learn the latest deep learning technologies and to analyze real-life cases for implementing Visual AI. Students can develop AI+X capabilities for creating new business opportunities by integrating AI into marketing, production, logistics, finance, and human resources.

•Conversational AI (3)

This course helps student to develop the capabilities to create new business opportunities by learning the latest deep learning application technologies and practices for implementing Conversational AI. Students can have opportunities for applying them across a wide range of firms' activities.

•Recommend System (3)

Students will develop the ability to build a recommendation system that meets customers needs by learning various recommendation algorithms and the techniques

for improving firms' performance.

•**Dara-driven decision making (3)**

This course learns how to improve the efficiency and competitiveness of an organization by collecting, analyzing, and interpreting data and applying it to management strategies and decision-making processes.

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