Testimonials

The DSA programme lays a very strong foundation in statistics, which is the backbone of data science. The professors are experts in their own fields and are dedicated to the students' learning, which makes the learning journey more fun! By exploring datasets in the real world, concepts are brought to life, and skills are easily transferable in professional data science.

LIM WEI CHIANG, BRYAN
BSc (Information Systems), second major in Applied Statistics,
Class of 2014
Data Scientist, Funding Societies

With the onset of Industry 4.0 and rapid digitalization, data analytics is a skill that is growing in importance and increasing in demand across all industries and job functions. This makes SOE's DSA major especially relevant, and it distinguishes itself with its focus on R, a major statistical programming language that many organisations (including mine) use on a daily basis. I believe that the DSA major provides an excellent foundation for any student intending to pursue a career in data analytics, as it will equip you with the knowledge and skills to stay ahead in this era of rapid technological advancement.

PATRINA TENG HUI LI
BSc (Econ), second major in Public Policy and Public Management,
Class of 2018
Assistant Manager, Communications Group, Prime Minister's Office

The Data Science and Analytics (DSA) major will equip students with the fundamental skills required for any data science project: data extraction, data cleansing, statistical analysis, modelling and data visualization. Students will also gain hands-on experience with R, one of the most popular languages used by the data science community. Hence, if you are passionate about using mathematics and programming to solve challenging business problems, a career in data science will be immensely rewarding and the DSA major will provide a sound foundation for you to pursue such a career.

YANG NENGYONG, DUSTIN
BSc (Econ), second major in Actuarial Science, Class of 2014
Data Scientist, Accenture

ENQUIRIES

If you want to know more about the DSA Second Major, please contact

Associate Professor of Economics (Education)
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GENERAL INFORMATION

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https://economics.smu.edu.sg/
bachelor-science-economics/
curriculum/2nd-major-in-data-
science-and-analytics

SMU
SINGAPORE MANAGEMENT UNIVERSITY

SCHOOL OF ECONOMICS

Second Major in Data Science and Analytics (DSA)

Overview

The ever-increasing amount of data and advanced compute technologies pose new opportunities as well as challenges for data analysts to turn data into insights. There is a pressing need for providing formal and rigorous training for students to develop proper skills to extract value from big data using state-of-the-art tools for statistical computing.

The DSA second major focuses on applications of statistical modelling, machine learning algorithms, computing and information technology as well as simulation and predictive approaches to solve real-world problems encountered in all private and public institutions. The curriculum of the second major adopts a hands-on pedagogy in mathematics, statistics and computer science, emphasizing practical applications related to economics, social sciences, finance, risk management, business, insurance, and more.

R is one of the most popular open-source programming languages for statistical computing. Data scientists and statisticians use R for data analysis in many fields. Every day the R user community adds new features to R to tackle rising statistical issues, encouraging experts from different fields to work together by communicating in this language. DSA equips students with up-to-date R programming skills in data import, wrangling and visualization, statistical analysis, and predictive modelling.

Educational Value and Outcomes

Highlights of the DSA major:

- Comprehensive and contemporary data analysis curriculum
- Enriched curriculum with computing modules from the School of Computing and Information Systems
- Solid foundation in statistical analysis and computing
- Hands-on pedagogy with applications of advanced compute technologies
- Covers a wide range of data science and analytics topics and their applications

The DSA curriculum is strategically designed to respond to the rapid development of data science.

DSA graduates will be able to:

- Understand computer intensive statistical methodologies
- Construct and manage databases that enable faster query performance
- Build reliable stochastic models by conducting proper data checking and validation
- Extract value from different types of data, such as economic and financial data, cross-sectional data, time series data, panel data, spatial data, and social and economic network data
- Master R, Python and SQL programming for querying databases, wrangling and visualizing data, statistical learning, and more
- Master the data science and analytics skills needed for the future of work, including big data and big compute technologies such as MySQL, Hadoop, and Spark
- Showcase a portfolio of projects at job interviews

All DSA second major students are supported in their data science journey by the DSA Society at SMU.

DSA Curriculum Structure

To fulfil the requirements of the DSA major, students must complete the following courses:

CORE COURSES

1. STAT201 Probability Theory and Applications
2. DSA201 Statistical Inference for Data Science
3. DSA211 Statistical Learning with R*
4. DSA212 Data Analytics with R
5. COR-IS1702 Computational Thinking**

ELECTIVE COURSES

Choose any four or five** courses in the Data Analysis (DA) List and Computing Technology (CT) List, with at least one course in each list.

- *DA LIST:*
  - DSA301 Time Series Data Analysis/ ECON233 Economic Forecasting
  - DSA303 Spatial Data Analysis
  - DSA305 Panel Data Analysis
  - DSA306 Big Data Analytics
  - ECON245 Applied Healthcare Analytics
  - MKTG228 Marketing Analytics/ OPIM326 Service and Operations Analytics/ ACCT420 Forecasting and Forensic Analytics
  - IS450 Text Mining and Language Processing
  - IS424 Data Mining and Business Analytics/ IS417 Data Warehousing and Business Analytics

- *CT LIST:*
  - COR1305 Spreadsheet Modeling and Analytics/ IS112 Data Management/ IS105 Business Data Management
  - IS428 Visual Analytics for Business Intelligence/ IS415 Geospatial Analytics and Applications
  - CS420 Introduction to Artificial Intelligence
  - CS421 Principles of Machine Learning/ IS460 Machine Learning and Applications

* Statistical Learning with R is mutually exclusive with Statistical Programming, which is a compulsory Accounting Core course for BAcc students. BAcc students can therefore take Statistical Programming instead of Statistical Learning with R to fulfil the requirements.

** Computational Thinking is also a Core Curriculum course under the Capabilities (Modes of Thinking) basket. Students may not double count this course towards both the Core Curriculum and the DSA Second Major. Therefore, students must complete (a) an alternative course to fulfil the Capabilities (Modes of Thinking) basket requirement of the Core Curriculum or (b) an extra DSA Second Major Elective. As Computational Thinking is a compulsory Core Curriculum course under the Capabilities (Modes of Thinking) basket for BSc (IS) students, BSc (IS) students are required to complete 5 CUs of DSA Second Major Electives instead of 4 CUs.