Data Science and Analytics

DIFFERENCES WITH OTHER PROGRAMMES

1. **How does this programme compare with the Business Analytics programme offered by the School of Computing (SoC)?**
The Data Science and Analytics (DSA) programme will help in producing much needed talent and expertise in data science to support Singapore's Smart Nation vision. SoC offers a Business Analytics programme, which has the objective of producing graduates who are able to apply existing analytical tools to a range of business problems.

   In comparison, the DSA programme has been designed with sufficient *technical* depth to equip our graduates with the ability to develop *novel* analytical tools for new scientific applications and industry problems that will emerge in future. This is achieved by (i) integrating statistics, mathematics and computing (via the capstone coursework courses) and (ii) being industry-driven (via a series of datathon-style courses). Information about one such datathon-style course can be found at nusmods.com/modules/DSA4261/sense-making-caseanalysis-logistics-and-transport.

PROGRAMME INFORMATION

1. **What is this programme?**
The Data Science and Analytics (DSA) undergraduate degree programme is an *interdisciplinary* programme offered by the Department of Mathematics and the Department of Statistics and Data Science in the Faculty of Science under the College of Humanities and Sciences (CHS), in conjunction with the Department of Computer Science in the School of Computing (SoC). This four-year direct Honours programme was the first of its kind in Singapore when it was launched in Academic Year 2016/2017 with an initial intake of about 50 students. The intake has increased significantly over the years and currently it is about 300 - 350 students each year. Starting from Academic Year 2021/2022, DSA students have the option to pursue specialisations in **Operations Research** or/and **Statistical Methodology**.

2. **What is data science?**
Data science is a rapidly developing field that involves computational principles, methods and systems for extracting and structuring knowledge from data. On a daily basis, large datasets (Big Data) are generated by activities in the sciences, society and commerce. Data scientists are constantly seeking patterns and predicting outcomes from these vast collections of data. This enables them to extract insights from Big Data to facilitate business decision-making.

3. **What are the features of the programme?**
The DSA programme is designed with sufficient technical depth to equip graduates with the ability to develop novel analytical tools for new scientific applications and industry problems that will emerge in future.

   - Interdisciplinary curriculum. A key facet is the interdisciplinary nature of the programme. You will read courses in mathematics, statistics and computer science, and be exposed to the interplay among these three key areas in the practice of data science.

   - Deep domain knowledge. Programmes offered under the CHS have a flexible curriculum structure. By pursuing appropriate Second Major, Major-Minor and specialisation pathways, you will gain in-depth exposure to artificial intelligence, computation and optimisation, computer algorithms, database and data processing, data mining and machine learning and high-dimensional statistics.

   - Experiential learning. You will undertake a capstone course that is industry-driven, where you will have the opportunity to work on practical problems that are related to real-life data and workplace challenges.

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4. **What is co-operative education and how is it conducted in the DSA programme?**
The Co-operative (Co-op) Education Programme at NUS formally integrates academic studies with relevant work experience. You will complete multiple internship stints alternating with regular academic semesters over your four-year candidature at NUS. Co-operative education is optional. Starting from Academic Year 2021/2022, DSA students who choose to undertake the Co-op pathway will spend three semesters/terms (12 months) at the workplace with reputable employers. This will equip you with the skills, knowledge and expertise that enhance your employability after graduation.

   We have entered into partnerships with several companies and organisations to offer internships for the DSA Co-op programme. These companies and organisations include government agencies, telecommunications companies, management consulting, defence science agencies, banking/financial institutions, port operators, multisector corporations, etc.

5. **Do students learn about Artificial Intelligence (AI) in the programme?**
You may choose to read a Minor in AI (offered by the School of Computing) to learn about the use of AI in computer vision, pattern recognition and natural language processing.

APPLICATION/ADMISSION

1. **What are the admission requirements for the programme?**
Applicants should have a very good H2 pass (or equivalent) in Mathematics/Further Mathematics. Students without these prerequisites are required to read the bridging course in Mathematics (MA1301 or MA1301X).

CAREER PROSPECTS

1. **What are the career prospects for graduates from this programme?**
Graduates of this programme will have career opportunities as data science professionals in the public sector which includes Smart Nation work, as well as in diverse industries where there is a growing need for extensive data collection, processing and analysis. These include biomedical sciences, business intelligence, clean technology, consumer businesses, data science and analytics, e-commerce, finance, healthcare, infocommunications, manufacturing, marketing, re/insurance, safety and security, technology, telecommunications, transportation etc.