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Hong Kong/ Education

## CityU's data science master degree puts graduates on the cutting edge

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Advances in technology are having a major impact in the workplace, creating new roles, changing job content, and obliging everyone to acquire the skills needed to keep pace with developments in a fast-moving environment.



Those circumstances no doubt explain the demand for places on the Master of Science in Data Science (MSDS) programme offered by City University of Hong Kong (CityU).

But it is also attracting applicants from fields like banking, accounting, logistics, real estate and marketing, who see that relevant expertise will enhance their standing as problem solvers, strategists and managers and open the door to all kinds of new opportunities.



“As data collection technology continues to develop and becomes cheaper, companies in different sectors want to take advantage of it,” says Dr Matthias Tan, Associate Professor at CityU’s School of Data Science and Programme Leader for MSDS programme. “By analysing the data they have, they can improve decision making and overall business performance. Right now, the field is expanding very quickly in terms of methodology and data collection techniques, so I am confident that demand for data scientists will continue to grow.”

As a result, each September intake for the MSDS admits around 100 students. They are expected to take five core courses and five electives to achieve a total of 30 credits. The foundational modules cover areas such as exploratory data analysis and visualisation, statistical machine learning, and storing and retrieving data. This provides strong training in key aspects of both theory and practice.

The list of electives gives students scope to pick courses tailored to their professional interests and career needs. The choices include everything from AI and blockchain to natural language processing and optimisation. But there are also cross-disciplinary options, offered in collaboration with CityU’s Department of Computer Science, and application-led courses on predictive analysis for finance and smart cities.

If preferred, students can opt to take three electives and write a dissertation. Doing so allows them to tackle a research-based project, set out their ideas, and write up the findings. The work is supervised by a professor.

“I encourage students to do the dissertation course if they intend to take a PhD or pursue a career in research, rather than work in industry,” says Tan, who completed a doctorate in industrial and systems engineering at the Georgia Institute of Technology. “Our main aim, though, has been to create a curriculum that meets the present needs of the world of business by training students to apply state-of-the-art data science techniques to solve real industrial problems.”

considered as necessary, whilst it is a prerequisite for those applying under Hong Kong's Taught Postgraduate Fellowship Scheme.

Since the programme began in 2018, it has attracted many applicants with undergraduate degrees from leading universities variously ranked by the QS Top 200, the C9 League, Project 985, and other similar classifications.

In the most recent round, Tan has noticed a significant proportion of applicants from mainland China, as well as an increasing number with working experience.

“We offer some introductory and review materials in the courses, so everyone can follow things easily from the start of the programme,” he says. “Our students have different backgrounds and some, for example, may not have had much exposure to statistics or machine learning. If so, the professors will try to provide extra material and instruction.”

Since the lifting of COVID social distancing restrictions, all classes are now taught at the CityU campus in Kowloon Tong. Online instruction and recorded lectures were an essential alternative over the past three years. But the clear intention now is to re-establish the vibrant sense of interaction, discussion and teamwork that in-person learning provides – and to ensure students do not feel disconnected.



To keep improving the MSDS, the School has invested in new computers to explore “deep learning”. There are plans to hire new faculty members for cutting-edge areas like natural language processing and AI. And applied courses may be added on the latest methods for analysing very big data sets.

“Nowadays, the size of data sets from industry is growing exponentially, so we need to train students for that,” says Tan, whose own research interests focus on uncertainty quantification for computer simulation.

He adds that MSDS graduates typically go on to good jobs which pay well. The range of posts continues to expand, with a recent survey showing companies keen to hire data mining specialists, algorithm engineers, business intelligence analysts, and compute vision engineers.

“We are preparing student for careers in data science, which is a very hot area right now,” Tan says. “Hong Kong has a strategic location, good resources, and a strong financial sector. It has what’s needed to be a leader in data science and a centre for the industry in Asia.”

