



Master of Science in Data Science and Engineering

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A graduate program in the emerging field which addresses the growing need to utilize the massive amounts of unstructured data.



Data science and engineering is an emerging field which addresses the growing need to utilize the massive amounts of unstructured data that is generated continuously by companies, users, and devices, and extracting key knowledge and understanding from it. The Master of Science in data science and engineering program is designed for those who want to pursue a career in data analytics, a field where effectively deriving valuable insights and relevant information from raw data takes considerable knowledge, skill, and analytical thinking.

The HBKU Master of Science program in data science and engineering aims to provide students with a strong foundation in data engineering, big data science, and data analysis. The program integrates the knowledge, expertise, and educational assets of HBKU and its research institutes in data collection, management and analytics, and scalable data-driven knowledge discovery, as well as the fundamental concepts behind these techniques. The program aims to equip students with state-of-the-art methods and theory related to the next generation of big data technology. The program offers its students the option of either completing a research thesis, or working on an industrial project. The thesis requires substantial theoretical and research components while the industrial project offers a route for students to further develop real-world, practical, problem-solving experience. The program includes a core course in leadership and innovation, highlighting an emphasis within the program of producing graduates equipped with the skills and knowledge to take on leading roles within academic, governmental and non-governmental organizations.

The program offers flexibility by enabling students to focus on different areas of interest through the choice of electives and projects related to data science and engineering, such as data collection, storage, management, analysis, and knowledge extraction and discovery.

Information is the oil of the 21st century, and analytics is the combustion engine.”

Peter SondergaardGartner Research

Program Focus

Fundamental knowledge in data science, engineering and technology covering important aspects and spanning areas such as applied statistics, machine learning, and technological tools such as cloud platforms for large-scale data analysis.

Hands-on experience on real-world projects related to scalable big data collection, storage, management, analysis and mining, as well as knowledge extraction and discovery.

Research thesis or industrial project involving original work related to data science and engineering guided by world-class faculty members from the College of Science and Engineering and from the HBKU research institutes.

Curriculum

A 33-credit program, taught in English, typically over two years that includes:

- Four core courses that provide students coming from diverse backgrounds with a coherent learning environment to tackle issues in data science and engineering. The core courses are:
 - Research Methods and Ethics
 - Applied Statistics
 - Advanced Data Management Systems
 - Computational Data Analytics & Tools
- Four elective courses covering some engineering and science fundamentals in addition to a variety of data science and engineering electives, providing students with a solid base and depth to fully understand different aspects of data science and engineering and the interrelations between them.
- Two semesters of graduate research seminars aimed at expanding the students’ horizons by offering a broad range of topics covered through invited talks and presentations from industry, research institutes, academia, and government institutions and organizations.

- One course on leadership and innovation aimed at providing students with the skill sets required to tackle the challenges of the 21st century.

This course is an elective, recommended for students who wish to be exposed to entrepreneurship topics.

- Students are also recommended to take a machine learning course as an elective
 - A nine-credit research thesis or six-credit industrial project.
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Research

Research is integral to Hamad Bin Khalifa University's mission to help build human capacity in Qatar, playing a pivotal role in HBKU's academic programs across all its colleges.

- [Qatar Biomedical Research Institute \(QBRI\)](#)
- [Qatar Computing Research Institute \(QCRI\)](#)