



PhD in Computer Science and Engineering

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A doctoral program providing exposure to groundbreaking research and invaluable experience in the high-demand field of computer science and engineering.



Doctoral students will gain exposure, and contribute to, groundbreaking research, giving them invaluable experience that will translate into an exciting, challenging, and well-compensated job in the high-demand field of computer science and engineering.

The HBKU Computer Science and Engineering PhD program provides students with a solid, fundamental, and advanced education, as well as strong research experience and a broad understanding of aspects related to computer science and engineering. The program aims to equip students with advanced, up-to-date knowledge of computer science and engineering, plus the methods, tools, and technologies needed to explore this fast-evolving field. The program provides a broad, multidisciplinary, research-intensive education at the boundary of computer science and engineering while providing specialization streams in contemporary fields that are globally important and also relevant to Qatar, such as systems and computer security, software engineering, computational sciences, computer architecture and VLSI, robotics machine perception, sensing technologies, human computer interface (HCI), Big Data and data analytics, machine learning and artificial intelligence, computer vision and graphics, and wireless and mobile computing and networking. Students have the opportunity to perform research alongside world-class faculty who are leaders in their respective fields. Students gain access to state-of-the-art laboratories and facilities within HBKU including the HBKU Research Complex. Students develop skills that position them to take leading roles in an exceptionally active and highly competitive area of the job market.

Students without a master's degree but with exceptional performance in an approved bachelor's degree may be admitted to the PhD program but will need to take nine additional credits of coursework (3 elective courses). PhD students should pass a candidacy examination after their second semester and successfully defend their thesis proposal to their committee after their fourth semester of study.

Program Focus

This program focuses on the core skills needed to build a successful and advanced career in computer science, engineering, and technology-related areas. It explores research methods, advanced algorithms and data structure, computer architecture and VLSI, ethics, technical writing, and a number of relevant specialties.

Students are required to conduct original and guided research with faculty supervision that concentrates on the contemporary issues in computer science and engineering that are globally important and are also relevant to Qatar.

The program provides the students with a broad understanding of the field, together with the flexibility to specialize in contemporary and up-to-date areas of computer science and engineering.

The multidisciplinary approach to the curriculum builds fundamental knowledge that evolves in line with the developments taking place within the field of computer science and engineering, equipping graduates with the tools needed to pursue a wide variety of career paths.

Curriculum:

This program comprises a minimum of 54 credits and is taught in English, typically over three years (for students already possessing a master's degree) or four years (for students without a master's degree) which includes:

- **The core courses are:**

- Research Methods and Ethics in ICT
- Applied Data Analytics

- **One of the following two courses is required to complete the three-core course requirement, depending on whether the student is interested in a hardware or software research area:**

- Principles of Computer System Design
- Advanced Algorithms and Data Structures
- Three elective courses covering some engineering and science fundamentals plus a variety of computer science and engineering electives, which provide students with a solid base to fully understand different aspects of computer science and engineering and the interrelations between them
- Three semesters of graduate research seminars
- A research thesis with a minimum of 36-credits under the supervision of an adviser and a PhD dissertation committee

- PhD students should pass a qualifying examination after their second semester of study, successfully defend their thesis proposal to their committee after their fourth semester of study, and successfully complete a PhD dissertation.
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