

# COMPUTER SCIENCE AND ENGINEERING, PHD

CSE's PhD program in Computer Science and Engineering 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 that will translate into exciting, challenging, and well-compensated job opportunities in this high-demand field.

For more information, click here (<https://www.hbku.edu.qa/en/cse/phd-computer-science-engineering/>).

## Requirements

Minimum hours required to complete program 60 CH

| Code  | Title   | Hours |
|---|---|-------|
| <b>Core Courses</b>   |   |       |
| ICT 601   | Research Methods and Ethics   | 3     |
| ICT 705   | Applied Data Analytics  | 3     |
| CSEG 710<br>or CSEG 780   | Advanced Algorithms and Data Structures<br>Principles of Computer System Design | 3     |
| Subtotal  |   | 9     |
| <b>Elective Courses</b>   |   |       |
| Select three of the following:                                    |   | 9     |
| Free elective: Students can take one course from any HBKU program |   |       |
| CSE 602   | Statistics for Science and Engineering  |       |
| CYSE 610  | Applied Cryptography  |       |
| CYSE 630  | Computer and Network Security   |       |
| CYSE 640  | Security Risk Analysis  |       |
| CYSE 720  | Data Privacy  |       |
| CYSE 727  | Wireless Networks & Security  |       |
| CYSE 728  | Distributed Systems Security  |       |
| CYSE 729  | Multimedia Security   |       |
| CYSE 744  | Network Forensics   |       |
| CYSE 745  | Computational Forensics   |       |
| DSEG 660  | Applied Deep Learning   |       |
| DSEG 682  | Special Topics in Data Science and Engineering                                  |       |
| DSEG 733  | Advanced Data Management System   |       |
| DSEG 735  | Learning from Data  |       |
| DSEG 760  | Machine Learning  |       |
| ICT 615   | AI for Social Media and Multimedia Applications                                 |       |
| ICT 620   | Computer Graphics   |       |
| ICT 632   | Advanced Applications of the Web and Internet                                   |       |
| ICT 660   | Principles of Health Informatics  |       |
| ICT 665   | Artificial Intelligence and Machine Learning in Healthcare                      |       |
| ICT 666   | Computational Bioinformatics  |       |
| ICT 668   | Medical Image Processing  |       |
| ICT 670   | Information Technology Project Management                                       |       |
| ICT 671   | Information Systems Management  |       |
| ICT 675   | Healthcare Information Systems  |       |
| ICT 676   | Information Systems Analysis and Design   |       |
| ICT 690   | Special Topics  |       |
| ICT 706   | Independent Studies   |       |
| ICT 716   | Data Science Tools and Applications   |       |

|                                |                                    |           |
|--------------------------------|------------------------------------|-----------|
| ICT 720                        | Cloud Computing                    |           |
| ICT 725                        | Quantum Computing                  |           |
| ICT 726                        | Quantum Machine Learning           |           |
| ICT 736                        | Interactive Design for Health care |           |
| Subtotal                       |                                    | 9         |
| <b>Seminar</b>                 |                                    |           |
| Must pass twice                |                                    |           |
| ICT 701                        | Graduate Research Seminars         | 0         |
| Subtotal                       |                                    | 0         |
| <b>Dissertation</b>            |                                    |           |
| ICT 890                        | Dissertation Hours                 | 0-9       |
| Subtotal                       |                                    | 42        |
| <b>Non-Course Requirements</b> |                                    |           |
| 899                            | Dissertation Defense               | 0         |
| 790                            | Doctoral Qualifying Exam           | 0         |
| 799                            | Candidacy Exam                     | 0         |
| <b>Total Hours</b>             |                                    | <b>60</b> |

## Study Plan

| Course                  | Title  | Hours     |
|-------------------------|--|-----------|
| <b>First Year</b>       |  |           |
| <b>First Semester</b>   |  |           |
| ICT 601                 | Research Methods and Ethics  | 3         |
| ICT 701                 | Graduate Research Seminars   | 0         |
| ICT 705                 | Applied Data Analytics   | 3         |
| Elective 1              |  | 3         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Second Semester</b>  |  |           |
| CSEG 710<br>or CSEG 780 | Advanced Algorithms and Data Structures<br>or Principles of Computer System Design | 3         |
| Elective 2              |  | 3         |
| Elective 3              |  | 3         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Second Year</b>      |  |           |
| <b>First Semester</b>   |  |           |
| ICT 701                 | Graduate Research Seminars   | 0         |
| ICT 890                 | Dissertation Hours   | 9         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Second Semester</b>  |  |           |
| ICT 890                 | Dissertation Hours   | 9         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Third Year</b>       |  |           |
| <b>First Semester</b>   |  |           |
| ICT 890                 | Dissertation Hours   | 9         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Second Semester</b>  |  |           |
| ICT 890                 | Dissertation Hours   | 9         |
| <b>Semester Hours</b>   |  | <b>9</b>  |
| <b>Fourth Year</b>      |  |           |
| <b>First Semester</b>   |  |           |
| ICT 890                 | Dissertation Hours   | 6         |
| <b>Semester Hours</b>   |  | <b>6</b>  |
| <b>Total Hours</b>      |  | <b>60</b> |