

# CYBERSECURITY, MASTER OF SCIENCE

Cybersecurity is a multidisciplinary field addressing issues that ensure secure and reliable operations at all levels of interconnected computing and networking systems. The Master of Science in Cybersecurity is designed to train graduate scholars, professionals, entrepreneurs, leaders, and researchers in the advanced knowledge and skills required to fully understand and implement the technologies, tools, management methods, and policy issues related to cybersecurity.

This Master of Science program not only covers multidisciplinary fields related to cybersecurity technology but also examines policy, ethics, and management related to IT security and cyber threats. The program leverages strong partnerships and collaborations both within HBKU and beyond the university. Delivery of the program involves collaborations with HBKU's research institutes, most notably with QCRI.

For more information, click here (<https://www.hbku.edu.qa/en/cse/ms-cybersecurity/>).

## Requirements

Minimum hours required to complete program 33 CH

| Code  | Title   | Hours |
|---|---|-------|
| <b>Core Courses</b>   |   |       |
| CYSE 610  | Applied Cryptography  | 3     |
| CYSE 630  | Computer and Network Security                               | 3     |
| CYSE 640  | Security Risk Analysis                                      | 3     |
| ICT 601   | Research Methods and Ethics                                 | 3     |
| Subtotal  |   | 12    |
| <b>Elective Courses</b>   |   |       |
| Select four of the following:                                     |   | 12    |
| Free elective: Students can take one course from any HBKU program |   |       |
| CSE 602   | Statistics for Science and Engineering                      |       |
| CSEG 605  | Convex Optimization for Large-Scale and Distributed Systems |       |
| CSEG 710  | Advanced Algorithms and Data Structures                     |       |
| CSEG 780  | Principles of Computer System Design                        |       |
| 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 733  | Advanced Data Management System                             |       |
| DSEG 735  | Learning from Data  |       |
| ICT 632   | Advanced Applications of the Web and Internet               |       |
| ICT 690   | Special Topics  |       |
| ICT 705   | Applied Data Analytics                                      |       |
| ICT 706   | Independent Studies   |       |
| ICT 716   | Data Science Tools and Applications                         |       |
| ICT 720   | Cloud Computing   |       |
| ICT 725   | Quantum Computing   |       |
| Subtotal  |   | 12    |
| <b>Seminar</b>  |   |       |
| Must pass one time  |   |       |
| ICT 701   | Graduate Research Seminars                                  | 0     |

|                                |  |           |
|--------------------------------|--|-----------|
| Subtotal                       |  | 0         |
| <b>Thesis or Project</b>       |  |           |
| Select one of the following:   |  | 0-9       |
| ICT 695                        | Master's Thesis Hours                                |           |
| ICT 698                        | Industrial/ Project (+ One elective from list above) |           |
| Subtotal                       |  | 9         |
| <b>Non-Course Requirements</b> |  |           |
| 699                            | Thesis Defense                                       | 0         |
| <b>Total</b>                   |  | <b>33</b> |

## Study Plan

### Project

| Course                 | Title                         | Hours     |
|------------------------|-------------------------------|-----------|
| <b>First Year</b>      |                               |           |
| <b>First Semester</b>  |                               |           |
| CYSE 610               | Applied Cryptography          | 3         |
| CYSE 630               | Computer and Network Security | 3         |
| ICT 601                | Research Methods and Ethics   | 3         |
| ICT 701                | Graduate Research Seminars    | 0         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Semester</b> |                               |           |
| CYSE 640               | Security Risk Analysis        | 3         |
| Elective 1             |                               | 3         |
| Elective 2             |                               | 3         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Year</b>     |                               |           |
| <b>First Semester</b>  |                               |           |
| Elective 3             |                               | 3         |
| Elective 4             |                               | 3         |
| Elective 5             |                               | 3         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Semester</b> |                               |           |
| ICT 698                | Industrial/ Project           | 6         |
| <b>Semester Hours</b>  |                               | <b>6</b>  |
| <b>Total Hours</b>     |                               | <b>33</b> |

## Thesis

| Course                 | Title                         | Hours     |
|------------------------|-------------------------------|-----------|
| <b>First Year</b>      |                               |           |
| <b>First Semester</b>  |                               |           |
| CYSE 610               | Applied Cryptography          | 3         |
| CYSE 630               | Computer and Network Security | 3         |
| ICT 601                | Research Methods and Ethics   | 3         |
| ICT 701                | Graduate Research Seminars    | 0         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Semester</b> |                               |           |
| CYSE 640               | Security Risk Analysis        | 3         |
| Elective 1             |                               | 3         |
| Elective 2             |                               | 3         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Year</b>     |                               |           |
| <b>First Semester</b>  |                               |           |
| ICT 695                | Master's Thesis Hours         | 3         |
| Elective 3             |                               | 3         |
| Elective 4             |                               | 3         |
| <b>Semester Hours</b>  |                               | <b>9</b>  |
| <b>Second Semester</b> |                               |           |
| ICT 695                | Master's Thesis Hours         | 6         |
| <b>Semester Hours</b>  |                               | <b>6</b>  |
| <b>Total Hours</b>     |                               | <b>33</b> |