FACULTY OF COMPUTING AND ENGINEERING SCIENCES

MS Cyber Security

The MS (Cyber Security) program is of 2-years duration offered in the evening. It requires 33 credit hours, including 4 core courses (3 credits each), 5 elective courses (3 credits each) and a thesis (2 x 3 Credits). Although the institutional administration emphasize and encourage students to undertake research, they can take two courses in lieu of research. If student opts for course work only, he/she is required to complete 11 courses of 3 credit hours each. Else, the student is required to complete 9 courses (27 credit hours) and two Independent Research Studies (6 credit hours) OR a Thesis (6 credit hours). The maximum time limit to complete the MS (Cyber Security) degree is 4 years.

Why Study Cyber security?

The world is adapting innovative IT solutions such as mobile technology, online banking and electronic government services into everyday use. However, with so many e-solutions and such extensive use of the Internet, attention needs to be turned to the security issue. Cyber systems require innovative and secure IT solutions for everyday use. Therefore, the demand for skilled security professionals is arising to protect against cyber-attacks. Offered through the Department of Computer Science, MS (Cyber security) is designed to respond to the fast-growing demand for technical cyber security experts nationally and internationally. It provides the necessary foundations for the design and development of systems that need to be secure. The major focus will be given to the design of secure systems that exhibit confidentiality, integrity, and availability. The program will provide students with core skills in wide aspects of the security of information systems.

Key objectives of the program are as follow:

PEO-1 Recognize and evaluate security requirements and issues in organizations using IT systems.
PEO-2 Assess cyber security risk management policies to protect an organization's critical information and assets adequately.
PEO-3 Measure the performance of security systems within an enterprise-level information system to maintain and update an enterprise-level information security system.
PEO-4 Implement continuous network monitoring and provide real-time security solutions.

Research Based Stream

First Year

First Semester

CYS 5101	Applied Cryptography
CYS 5103	Network Security
CYS 5102	Information Security

Second Semester

CYS 5201	Digital Forensics
CYS 5xxx	Elective-I
CYS 5xxx	Elective-II

Second Year

Third Semester

CYS 5xxx	Elective-III
CYS 5xxx	Elective-IV
CYS 5109	Thesis (Part-1) /IRS-I

Fourth Semester

CYS 5xxx	Elective-V
CYS 5209	Thesis (Part-II) /IRS-II

Course Work Based Stream

First Year

First Semester

CYS 5101	Applied Cryptography
CYS 5103	Network Security
CYS 5102	Information Security

Second Semester

CYS 5201	Digital Forensics
CYS 5xxx	Elective-I
CYS 5xxx	Elective-II

Second Year

Third Semester

CYS 5xxx	Elective-III
CYS 5xxx	Elective-IV
CYS 5xxx	Elective-V

Fourth Semester

CYS 5xxx	Elective-VI
CYS 5xxx	Elective-VII

FACULTY OF COMPUTING AND ENGINEERING SCIENCES

Electives Courses

CYS 5234	Network Penetration Testing and Countermeasures
CYS 5237	Security in Mobile and Wireless Networks
CYS 5332	Ethical Hacking
CYS 5334	Malware Detection and Analysis
CYS 5232	Blockchain and Crypto Assets
CYS 5333	Intrusion Detection and Firewalls
CYS 5235	Reverse Engineering and Malware Analysis
CYS 5335	Security and Privacy for the Smart Grid
CYS 5233	Machine Learning for Cyber Security
CYS 5337	Security Modelling and Analysis of Mobile Agent Systems
CYS 5236	Security in Ad Hoc Sensor Networks
CYS 5336	Security in Cloud Environment
CYS 5231	Advanced Topic in Cyber Security - I
CYS 5331	Advanced Topic in Cyber Security - II
CYS xxxx	Research Methodology

Deficiency Courses
Programming Fundamentals (Core Programming Course)
Data Structures & Algorithms OR Design & Analysis of Algorithms
Computer Networks

DISTRIBUTION OF CREDIT HOURS

Course type	Min No. of Courses Min	No. of Credit Hours
Core Courses	4 x 3	12
Electives	5 x 3	15
Thesis	2 x 3	06
Total		**33**

Pre-Requisites:
For any advanced course, pre-requisite course must have been taken before.

PhD (Computing)

The PhD program requires students to complete 48 credit hours. Course work of 18 credits (6 courses) is needed which include core courses, electives and Independent Research Study. Dissertation of 30 credits is also required to complete. The maximum time limit to complete the PhD degree is 8 years.

First Year

Fall Semester

CSC 6101	Research Methodology*
CSC 6xxx	Elective-I
CSC 6xxx	Elective-II

Spring Semester

CSC 6xxx	Independent Research Study
CSC 6xxx	Elective-III
CSC 6xxx	Elective-IV

Second Year

Fall Semester

CSC 6xxx	Dissertation

Spring Semester

CSC 6xxx	Dissertation

Third Year

Fall Semester

CSC 6xxx	Dissertation

Spring Semester

CSC 6xxx	Dissertation

Elective courses are listed under different streams in MS Computer Science, MS Data Science and MS Cyber Security program.

Followed by successful completion of the course-work, Comprehensive Examination is required to pass in order to acquire PhD Candidacy after which research period starts. The entire research work is carried out under the supervision of the PhD supervisor who is assigned and approved as per the university procedure. The complete research work is required to be submitted in the form of a "Dissertation" after a minimum period of two years.

PhD course-work credits may be implemented via selection of a particular mode of course execution (as recommended by the BASR).

*The course of Research Methodology is compulsory if not done in Masters.