Master of Technology in Cyber Security

The overall credits structure

Category	PC	PE	OE	Total
Credits	32	16-24	0	48 - 56

Program Core

JCD891 Minor Project	0 0 6	3
JCD892 M.Tech. Project Part-I	0 0 12	6
JCD893 M.Tech Project Part-II	0 0 24	12
COL702 Advanced Data Structures/ELL781 Software Fundamentals for Computer Tech**	3 0 2	4*
COL759/Cryptography & Computer Security/MTL730 Cryptography	3 0 0	3
SIL765 Network and System Security/ ELL810 Cyber Security and Information Assurance	3 0 2	4*

** Note the CSE background students will do COL702 and non-CS background students will do ELL781
or as instructed by PEC.
* Note that since ELL781 & ELL810 are 3-0-0 courses the lab component will be made up with
registering for JCP781(0-0-2)1 & JCP810 (0-0-2)1 respectively.

Total Credits   *32*

Bridge Courses - Min. 8 credits, may be waived in exceptional cases on recommendation by PEC

SIL618 Computer Architecture	3 0 2 4
COL633 Resources Management in Computer Systems	3 0 2 4
COL671 Artificial Intelligence	3 0 2 4
COL672 Computer Networks	3 0 2 4

Streamed Program Electives (PE)

*Program Electives can be added on the recommendation by PEC
* Note - Students are required to do three electives in their respective streams and one each in the other
two streams to ensure breadth.

Streamed Electives(JCS) in System Security and Cyber Forensics

JCS816 Independent Study	0 3 0 3	COL867 Special Topics in High Speed Networks	3 0 0 3
COL718 Architecture of high performance Computers	3 0 2 4	COL870 Special Topics in Machine Learning	3 0 0 3
		COL871: Special Topics in Programming Language	3 0 0 3
COL724 Advanced Computer Networks	3 0 2 4	COL874: Special Topics in Compiler and Lang Impl	3 0 0 3
COL728 Compiler Design	3 0 3 4.5	COL876: Special Topics in Formal Methods	3 0 0 3
COL729 Compiler Optimisation	3 0 3 4.5	COV881 Special Module in Hardware Systems	1 0 0 1
COL732 Virtualization and Cloud Computing	3 0 2 4	COV882 Special Module in Software Systems	1 0 0 1
COL733 Cloud Computing Technology Fundamental	3 0 2 4	COV887 Special Module in High Speed Networks	1 0 0 1
COL768 Wireless Networks	3 0 2 4	COL886 Special Topics in Operating Systems	3 0 0 3
COL851 Special Topics in Operating Systems	3 0 0 3	ELV710 Special Module in Cyber Security	1 0 0 1
COL861 Special Topics in Hardware Systems	3 0 0 3	ELL714 Basic Information Theory	3 0 0 3
COL864 Special Topics in Artificial Intelligence	3 0 0 3	ELL785 Computer Communication Networks	3 0 0 3
COL865 Special Topics in Computer Applications	3 0 0 3	ELL800 Numerical Linear Algebra and Optimization	3 0 0 3

in Engineering

Course	L T P C
ELL880 Special Topics in Computers-I	3 0 0 3
ELL881 Special Topics in Computers-II	3 0 0 3
ELL892 Internet Technologies	3 0 0 3
ELL893 Cyber-Physical Systems	3 0 0 3
ELL895 Network Security	3 0 0 3
ELL897 Network Management	3 0 0 3
MSL852 Network System: Applications and Management	3 0 0 3
MSL855 Electronic Commerce	3 0 0 3
MSL878 Electronic Payments	1.5 0 0 1.5
MSL893 Public Policy in the Information Age	1.5 0 0 1.5
MTL744 Mathematical Theory of Coding	3 0 0 3
SIL771 Special Topics in Cyber Security	3 0 0 3
SIL773 Digital Watermarking and Steganography	3 0 0 3
SIL775 Biometric Security	3 0 0 3
SIL777 Secure Programming Methodologies	3 0 2 4
SIL779 Data Privacy	3 0 0 3
SIV810 Special Module in Cyber Security	1 0 1 1.5
SIV812 Special Module in Computer Forensics	1 0 1 1.5
SIV814 Special Module in Application Security	1 0 1 1.5
SIV895 Special Module on Intelligent Information Processing	1 0 0 1

Streamed Electives(JCS) in Cryptography and Cryptanalysis

Course	L T P C
JCS816 Independent Study	0 3 0 3
COL730 Parallel Programming	3 0 2 4
COL774 Machine Learning	3 0 2 4
COL864 Special Topics in Artificial Intelligence	3 0 0 3
COL865 Special Topics in Computer Applications	3 0 0 3
COL870 Special Topics in Machine Learning	3 0 0 3
COL872 Special Topics in Cryptography	3 0 0 3
COV878 Special Module in Machine Learning	1 0 0 1
COV884 Special Module in Artificial Intelligence	1 0 0 1
ELL710 Coding Theory	3 0 0 3
ELL712 Digital Communications	3 0 0 3
ELL711 Signal Theory	3 0 0 3
ELL718 Statistical Signal Processing	3 0 0 3
ELL720 Advanced Digital Signal Processing	3 0 0 3
ELL800 Numerical Linear Algebra and Optimization in Engineering	3 0 0 3
ELL880 Special Topics in Computers-I	3 0 0 3
ELL881 Special Topics in Computers-II	3 0 0 3
MTL729 Comp. Algebra & its Applications	3 0 0 3
MTL735 Advanced Number Theory	3 0 0 3
MTL744 Mathematical Theory of Coding	3 0 0 3
MTL782 Data Mining	3 0 2 4
MTL811 Mathematical Foundation of AI	3 0 0 3
SIL771 Special Topics in Cyber Security	3 0 0 3
SIL773 Digital Watermarking and Steganography	3 0 0 3
SIL775 Biometric Security	3 0 0 3
SIL779 Data Privacy	3 0 0 3
SIV810 Special Module in Cyber Security	1 0 1 1.5
SIV812 Special Module in Computer Forensics	1 0 1 1.5
SIV814 Special Module in Application Security	1 0 1 1.5
SIL763 Introduction to Blockchains, Cryptocurrencies and Smart contracts	3 0 2 4
SIV895 Special Module on Intelligent Information Processing	1 0 0 1

Streamed Electives(JCS) in Embedded Systems and Hardware Security

Course	L T P C
JCS816 Independent Study	0 3 0 3
COL718 Architecture of High-Performance Computer	3 0 2 4
COL719 Synthesis of Digital Systems	3 0 2 4
COL720 Real-Time Systems	3 0 2 4
COL750 Foundations of Automatic Verification	3 0 2 4
COL788 Advanced Topics in Embedded Computing	3 0 0 3
COL861 Special Topics in Hardware Systems	3 0 0 3
COL862 Special Topics in Software Systems	3 0 0 3
COV889 Special Module in Concurrency	1 0 0 1
COL812 System Level Design and Modelling	3 0 0 3
ELV710 Special Module in Cyber Security	1 0 0 1
ELL720 Advanced Digital Signal Processing	3 0 0 3
ELL733 Digital ASIC Design	3 0 2 4
ELL748 System-on-Chip Design and Test	3 0 0 3
ELL765 Smart Grid Technology	3 0 0 3
ELL772 Planning and Operation of Smart Grid	3 0 0 3
ELL787 Embedded Systems and Applications	3 0 0 3
ELL880 Special Topics in Computers-I	3 0 0 3
ELL881 Special Topics in Computers-II	3 0 0 3
ELL883 Embedded Intelligence	3 0 0 3
MSL855 Electronic Commerce	3 0 0 3
MSL878 Electronic Payments	1.5 0 0 1.5
MSL893 Public Policy Issues in the Information Age	1.5 0 0 1.5
SIV810 Special Module in Cyber Security	1 0 1 1.5
SIV814 Special Module in Application Security	1 0 1 1.5
SIL771 Special Topics in Cyber Security	3 0 0 3
SIL773 Digital Watermarking and Steganography	3 0 0 3
SIL775 Biometric Security	3 0 0 3
SIL777 Secure Programming Methodologies	3 0 2 4
SIL781 Secure Hardware-based Systems Design	3 0 2 4

SIL763 Introduction to Blockchains, 3 0 2 4 Processing
Cryptocurrencies and Smart Contracts
SIV895 Special Module on Intelligent Information 1 0 0 1

Semester-wise Distribution of Courses

Sem	Courses (Number, abbreviated title, L-T-P, credits)				Lecture Course	Contact h/week				
						L	T	P	Total	Credits
I	COL702/ELL781+JCP781 **Advanced Data Structures/Software Fundamentals for Computer Tech** (3-0-2) 4/(3-0-0)3+(0-0-2)1	Bridge-1 (3-0-2)4	COL759/MTL730 Cryptography & Computer Security / Cryptography (3-0-0) 3	PE-1 (3-4)	3-4	9- 12	0	2-6	11-18	10-15
II	JCD891 Minor Project (0-0-6) 3	Bridge-2 (3-0-2)4	SIL765/ELL810 +JCP810 Cyber Security and Information Assurance/Network and System Security(3-0-2) 4/(3-0-0)3+(0-0-0)1	PE-2 (3-4)	2-3	6-9	0	8- 12	14-21	10-15
III	JCD892 MTP-I (0-0-12) 6	PE-3 (3-4)	PE-4 (3-4)		2	6	0	12-16	18-24	12-15
IV	JCD893 MTP-II (0-0-24) 12	PE- 5 (3)			1	3	0	20-22	23-25	15

Total = 48-56

NOTE:

1. Registration for MTP-II has a requirement of Min. CGPA 7.5 at the end 3rd sem and B Grade in JCD892. In exceptional cases PEC may waive the CGPA requirement
2. MTP – II can also be done in a collaborative manner with Industry/University.

In future joint degree programs with other institutes/universities can be considered.

We are proposing M. Tech in Cyber security with 20 seats with additional Full-time/Part-time sponsored candidates from Industry/Government.The admissions will be done through GATE in CS/EC/MA/EE as per Institute norms for other interdisciplinary programs.