

**The overall credits structure**

Category	PC	PE	OE	Total
Credits	32	16-24	0	48 - 54

**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 being 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. 6 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
COL724 Advanced Computer Networks	3 0 2	4	COL871: Special Topics in Programming Language	3 0 0	3
COL728 Compiler Design	3 0 3	4.5	COL874: Special Topics in Compiler and Lang Impl	3 0 0	3
COL729 Compiler Optimisation	3 0 3	4.5	COL876: Special Topics in Formal Methods	3 0 0	3
COL732 Virtualization and Cloud Computing	3 0 2	4	COV881 Special Module in Hardware Systems	1 0 0	1
COL733 Cloud Computing Technology Fundamental	3 0 2	4	COV882 Special Module in Software Systems	1 0 0	1
COL768 Wireless Networks	3 0 2	4	COV887 Special Module in High Speed Networks	1 0 0	1
COL851 Special Topics in Operating Systems	3 0 0	3	COL886 Special Topics in Operating Systems	3 0 0	3
COL861 Special Topics in Hardware Systems	3 0 0	3	ELV710 Special Module in Cyber Security	1 0 0	1
COL864 Special Topics in Artificial Intelligence	3 0 0	3	ELL714 Basic Information Theory	3 0 0	3
COL865 Special Topics in Computer Applications	3 0 0	3	ELL785 Computer Communication Networks	3 0 0	3
			ELL800 Numerical Linear Algebra and Optimization	3 0 0	3

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

### Streamed Electives(JCS) in Cryptography and Cryptanalysis

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

### Streamed Electives(JCS) in Embedded System and Hardware Security

JCS816 Independent Study	0 3 0 3	ELL880 Special Topics in Computers-I	3 0 0 3
COL718 Architecture of High-Performance Computer	3 0 2 4	ELL881 Special Topics in Computers-II	3 0 0 3
COL719 Synthesis of Digital Systems	3 0 2 4	ELL883 Embedded Intelligence	3 0 0 3
COL720 Real Time Systems	3 0 2 4	MSL855 Electronic Commerce	3 0 0 3
COL750 Foundations of Automatic Verification	3 0 2 4	MSL878 Electronic Payments	1.5 0 0 1.5
COL788 Advanced Topics in Embedded Computing	3 0 0 3	MSL893 Public Policy Issues in the Information Age	1.5 0 0 1.5
COL861 Special Topics in Hardware Systems	3 0 0 3	SIV810 Special Module in Cyber Security	1 0 1 1.5
COL862 Special Topics in Software Systems	3 0 0 3	SIV814 Special Module in Application Security	1 0 1 1.5
COV889 Special Module in Concurrency	1 0 0 1	SIL771 Special Topics in Cyber Security	3 0 0 3
COL812 System Level Design and Modelling	3 0 0 3	SIL773 Digital Watermarking and Steganography	3 0 0 3
ELV710 Special Module in Cyber Security	1 0 0 1	SIL775 Biometric Security	3 0 0 3
ELL720 Advanced Digital Signal Processing	3 0 0 3	SIL777 Secure Programming Methodologies	3 0 2 4
ELL733 Digital ASIC Design	3 0 2 4	SIL781 Secure Hardware-based Systems Design	3 0 2 4
ELL748 System-on-Chip Design and Test	3 0 0 3	SIL763 Introduction to Blockchains, Cryptocurrencies and Smart Contracts	3 0 2 4
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		