M.Tech Computer Science and Engineering

Proposed Structure

Total Credit Required	**80**
PC	**17**
PE	**23**
Mini Project/Capstone Project	**04**
M. Tech. Project	**36**

1st Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	Mathematical Foundations of Computer Science	PC	3	1	0	4
2.	Advanced Data Structures	PC	3	0	2	4
3.	Distributed Systems and Networking	PC	3	0	0	3
4.	PE-I*	PE	3	1	0	4*
5.	PE-II*	PE	3	0	2	4*
Total Credits: 19						

2nd Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	Advanced Algorithms	PC	3	1	0	4
2.	Research Methodology and IPR	PC	2	0	0	2
3.	PE-III*	PE	3	1	0	4*
4.	PE-IV*	PE	3	0	2	4*
5.	PE-V	PE	3	0	0	3
6.	Mini Project/Capstone Project #	Proj	0	0	8	4
Total Credits: 21						

Exit Option *with* ***Post-Graduate Diploma*** *by completing 40 credits from I and II Semesters. Students who exit after the first year shall be awarded the* ***Post-Graduate Diploma****.*

 # The Capstone Project will only appear on the early exit students' transcript(s).

3rd Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	PE-VI*$	PE	3	1	0	4*
2.	M. Tech. Project (In-house/Industry)	Proj	0	0	32	16
Total Credits: 20						

** Depending on the instructor's choice, PEs will be offered either with 1 credit as a tutorial or 1 credit as a lab.*

$ PE-VI will be offered as a MOOC course for the students who will opt for an industrial-based M.Tech. Project.

4th Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	M. Tech. Project (In-house/Industry)	Proj	0	0	40	20
Total Credits: 20						

Total Credits: 80

M. Tech. Project credits for III and IV Semesters may be replaced with Industrial Project or Industrial SLI.

List of Program Electives

1. Data Mining
2. Functional and Non Functional Testing
3. Software Matrices and Design Strategies
4. Cloud Computing
5. Big Data Analytics
6. Pervasive Computing
7. Cyber-Physical Systems: Design & Security
8. Deep Learning
9. Methods in Matrix Theory and Computation
10. Combinatorics for Computer Science
11. Generative Adversarial Networks
12. Distributed Systems
13. Deep Learning for NLP
14. Wearable Computing
15. Information Visualization
16. Digital Image Analysis
17. Introduction to Big Data
18. Modern Network Technologies
19. Information Security & Privacy
20. Advanced Social Networks Analysis
21. Computational Thinking
22. Communication Technologies for IoT
23. Real Time Systems
24. Queuing Systems Theory & Applications
25. Analytics for the Internet of Things
26. Maximum Entropy Principle & Applications
27. Malware: Threats and Analysis
28. Introduction to Cryptanalysis

M.Tech CSE specialization in Cybersecurity

Proposed Structure

Total Credit Required	**80**
PC	**17**
SC	**15**
SE	**8**
Mini Project /Capstone Project	**04**
Dissertation	**36**

1st Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	Mathematical Foundations of Computer Science	PC	3	1	0	4
2.	Advanced Data Structures	PC	3	0	2	4
3.	Distributed Systems and Networking	PC	3	0	0	3
4.	Computer System Security	SC	3	0	2	4
5.	Cryptography	SC	3	1	0	4
Total Credits: 19						

2nd Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	Advanced Algorithms	PC	3	1	0	4
2.	Research Methodology and IPR	PC	2	0	0	2
3.	Network and Web Security	SC	3	0	2	4
4.	Data Security and Privacy	SC	3	0	0	3
5.	PE-I	SE	3	0	2	4*
6.	Mini Project /Capstone Project	PC	0	0	8	4
Total Credits: 21						

3rd Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	PE-II[$]	SE	3	1	0	4*
3.	M.Tech. Project (In-house/Industry)*	Proj	0	0	32	16
Total Credits: 20						

4th Semester

Sr. No.	Course Description	Type	L	T	P	Credit
1.	M.Tech. Project (In-house/Industry)*	Proj	0	0	40	20
	Total Credits: 20					

Total Credits: 80

**Depending on the instructor's choice, PEs will be offered either with 1 credit as a tutorial or 1 credit as a lab*

$ PE-II will be offered as a MOOC course for the students who will opt for an industrial-based M.Tech. Project.

List of Program Electives (PE-I to PE IV)

1. Mobile Security
2. Blockchain technology and application (with lab)
3. Coding Theory
4. Cloud Security (with lab)
5. Program Analysis and verification
6. Secret Sharing and Multi-party Computation
7. Intrusion Detection System
8. Malware Analysis and design
9. Cryptanalysis
10. Internet Security and Privacy
11. Web Security
12. PKI and Trust Management (with Lab)
13. Secure Coding (with lab)
14. Distributed Systems Security
15. Network Security
16. Security Engineering
17. Digital and Cyber Forensics
18. Mobile and Cellular Network Security
19. Privacy and Security in Online Social Media
20. Network Anonymity and Privacy
21. Network Protocol Security
22. Ethical Hacking

Proposed curriculum for MTech (CSE) with Specialization in AI & ML

1st semester

Sr. No.	Course Name	Type	L	T	P	Credit
1	Mathematical Foundations of Computer Science	PC	3	1	0	4
2	Advanced Data Structures	PC	3	0	2	4
3	Distributed Systems and Networking	PC	3	0	0	3
4	AI: Principles and Techniques	SC	3	0	2	4
5	Foundations of Data Science	SC	3	0	2	4
Total Credits = 19						

2nd Semester

Sr. No.	Course Name	Type	L	T	P	Credit
1	Advanced Algorithms	PC	3	1	0	4
2	Research Methodology and IPR	PC	2	0	0	2
3	ML: Principles and Techniques	SC	3	0	2	4
4	Artificial Neural Network and Deep Learning	SC	3	0	2	4
5	PE-I	SE	3	0	0	3
6	Mini Project/ Capstone Project	Proj	0	0	8	4
Total Credits = 21						

3rd Semester

Sr. No.	Course Name	Type	L	T	P	Credit
1	PE-II	SE	3	1	0	4
2	M. Tech. Project (In-house/Industry)	Proj	0	0	32	16
Total Credits = 20						

4th Semester

Sr. No.	Course Name	Type	L	T	P	Credit
1	M. Tech. Project (In-house/Industry)	Proj	0	0	40	20
Total Credits = 20						

Total Credits = 80

Tentative List of Specialization Electives:

PE-I	PE-II
• Data Mining • IRWS • Social Networks • Intelligent Systems • Big Data Analytics • Reinforcement Learning	• Generative Adversarial Network • DL for NLP • Graph Neural Network • Deep Generative Models