Department of Computer Science and Engineering
Indian Institute of Technology, Hyderabad

2-year MTech in Networks & Information Security (TA) Curriculum

Below is the proposed curriculum structure for two-year MTech in Networks & Information Security (TA) program:

Course No	Course Title	Credits	Semester
CS6013	Advanced Data Structures and Algorithms	3	I
CS5060	Advanced Computer Networks	3	I
CS5130	Cryptology	3	I
CSxxxx	Core Elective	3	I
CS6903	Network Security	3	II
CS5996	Industry Lecture Series	1	When offered
LA5180	Communication Skills (Advanced)	1	When offered
OPTION A			
CSxxxx	Core Electives (see notes)	9	II
CS6035	Thesis (Stage-1)	4	Summer
CS6045	Thesis (Stage-2)	8	III
CS6055	Thesis (Stage-3)	12	IV
OPTION B			
CSxxxx	Core Electives (see notes)	21	II,III,IV
CS6695	Capstone Project 1	6	III
CS6705	Capstone Project 2	6	IV

There will be two points-of-entry (POE) for a student's induction into one of the above options (A or B) of the two-year MTech (TA) program:

- **POE 1 (Before Summer of Year 1):** The student chooses an option, at the time of the department guide allocation process (which happens before Summer of Year 1). Once Option B is chosen, there is no possibility to switch later to Option A.

- **POE 2 (After Summer of Year 1):** In the event the student chooses Option A, the student takes up Thesis Stage 1 course in the summer after Year 1. The department thesis evaluation committee (or student himself/herself) can decide at the end of this course whether to switch to Option B. In this case, these credits (and the corresponding grade) will count towards the elective requirement for the degree. Note that: (i) Once Option B is chosen, there is no possibility to switch later to Option A. (ii) If Option A continues to be chosen at POE 2, there is no possibility to switch later to Option B.

Other mandatory restrictions:

- The thesis or Capstone problem statements are expected to lie in the broad area of security: wireless/network/IoT security, cryptography/analysis, machine learning methods in security (e.g. intrusion detection), Formal Methods in Security, Secure coding, block chains, computational complexity aspects in crypto, etc.
- Only graduate-level courses offered by the CSE department can be counted towards the Core electives requirement.
- In case a student desires to count a non-graduate level course offered by CSE, or a course not offered by CSE, towards the core electives requirement, then the student needs to formally apply for an exception to DPGC along with an appropriate and detailed justification, and include a recommendation from his thesis advisor, or any other CSE faculty in case the advisor is not allocated. The DPGC is the approval authority in this matter; however, the DPGC cannot approve such an exception for more than three credits for the same student in case of non-CSE courses, and for more than nine credits in case of non-graduate CSE courses. In case the student wishes to count such exceptions towards the 6 credit requirement in the three categories, then he/she should further justify why it belongs to a particular category. The DPGC may approve the exception along with categorization or the exception alone.

Department of Computer Science and Engineering 3-Year M.Tech. (Networks and Information Security) Curriculum
(Effective from August 2022 batch)

Course No	Course Name	Number of Credits	Semester
CS6013	Advanced Data Structures & Algorithms	3	I
CS5060	Advanced Computer Networks	3	I
CS5130	Cryptology	3	I
CS6903	Network Security	3	II
CSxxxx	Core Electives	12	II/III/IV
CS6035	Thesis (Stage-1)	4	IV (Summer)
CS6045	Thesis (Stage-2)	8	V
CS6055	Thesis (Stage-3)	12	VI
CS5996	Industry Lecture Series	1	When offered
LA5180	Communication Skills Advanced	1	When offered

Notes:

- A maximum of 3 credits may be taken in mathematics department or any engineering department with the approval of DPGC which also designate the course to be part of any one of CS Core Electives
- A CS Core elective is a graduate level course offered by the CSE department.
- The DPGC will designate the courses for CS Core Elective that can be taken by the students of this program at the beginning of the 2nd semester.
- The selection of thesis guides will be done at the end of the first semester.
- The students can take up the thesis work in the CS department in the domain of Networks and Information Security.

Course Code	Course Name	Dept	Credits
CS6260	Topics in Wireless Networks	CSE	3
CS5453	Internet of Things	CSE	3
CS5553	Wireless Networks & Security	CSE	3
CS6220	Topics in Networks	CSE	3

CS5070	Networked Wireless Systems	CSE	3
CS6190	Advanced topics in Cryptology	CSE	3
CS5140	Quantum Cryptography	CSE	3
CS5543	The Blockchain: Theory and Practice	CSE	
CS5530	Basics of BlockChains: Distributed Computing Perspective	CSE	
CS5643	Software Defined Networks	CSE	1
CS5650	Data Center Networking	CSE	1
CS5610	Applied Machine Learning	CSE	3