1.	Title of the course	Network Information Theory
2.	Course number	EE602L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE6022/7
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** The present course aims to explore optimal performance limits and efficient information processing strategies to achieve fundamental capabilities and limitations of communication networks.	
10.	**Course Content:** Multiple access channel (MAC): Achievable result for MAC using successive decoding; Outer bound on the capacity region of MAC; Gaussian MAC and its capacity analysis; Broadcast channel (BC): Superposition coding scheme and its optimality for the degraded broadcast channel; Relation between the capacity region of Gaussian BC and MAC; Interference channel (IC) : Information theoretic limits of conventional techniques such as time-sharing and treating interference as noise; Han-Kobayashi scheme and its performance analysis; Advanced interference mitigation techniques such as interference alignment; Relay channels: Information theoretic limits of different relay forwarding schemes such as Amplify and Forward and Decode and Forward.	
11.	**Textbook(s):** 1. El Gamal A and Kim Y H, *Network Information Theory*, Cambridge University Press (2011). 2. Cover T and Thomas J A, *Elements of Information Theory*, Wiley Student Edition (2006).	
12.	**Reference(s):** 1. Kramer G, *Topics in Multiuser Information Theory: Foundations and Trends in Communications and Information Theory*, NOW Publisher (2008). 2. Yeung R W, *Information Theory and Network Coding*, Springer (2008). 3. Tse D and Viswanath P,Fundamentals of Wireless Communication, Cambridge University Press (2005).	