1.	Title of the course	Advanced Communication
2.	Course number	EE510L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5202/6
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** The objective of the course is to introduce the students to advanced topics in digital communications. The course aims to provide the students an understanding of the fundamental concepts and techniques, used in the design, performance analysis, and implementation of current communication systems as well as development of future communication system. This course is beneficial to students interested in pursuing research in related fields like Wireless Communications, Coding Theory, Signal Processing, Detection and Estimation Theory. The course will provide the student the necessary tools to understand the emerging communication techniques/systems such as OFDM, GSM, 3G, 4G/LTE and 5G	
10.	**Course Content:** Deterministic and random signal analysis: Bandpass and lowpass signal representation, Signal space representation of waveforms, random process; Digital Modulation Schemes and optimum receiver design: Memoryless modulation schemes, Signalling scheme with memory, optimum receiver for AWGN channel and error probability analysis for different modulation schemes; Multi-carrier systems: Multipath and fading in wireless communication system, Doppler spread, Delay Spread, Single carrier versus multi carrier system, Orthogonal Frequency division multiplexing (OFDM), Modulation and demodulation in OFDM systems, Direct sequence spread spectrum signals, Frequency hoping spread spectrum signals, Introduction to multi-carrier (MS) DS-CDMA; Multiple antenna systems: Channel models, Capacity analysis for multiple antenna system, Introduction to space-time codes.	
11.	**Textbook(s):** 1. John Proakis and Massoud Salehi, *Digital Communications*, McGraw Hill (2008).	
12.	**Reference(s):** 1. Simon Haykin,Digital Communication Systems, Wiley (2013). 2. Lathi B P and Zhi Ding, *Modern Digital and Analog Communication Systems*, Oxford Publication (2011). 3. David Tse and Pramod Viswanath, *Fundamentals of Wireless Communication*, Cambridge University Press (2005).	