

1.	Title of the course	Machine Learning for Wireless Communications
2.	Course number	EE565L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	New
5.	To be offered by	Electrical Engineering
6.	Prerequisite	CoT
7.	Course Objective(s): To introduce the tools required to solve relevant problems in the domain of wireless communications using machine learning techniques.	
8.	Course Content: Review of machine learning techniques: supervised and unsupervised learning, introduction to neural networks and deep neural networks, autoencoders, basics of reinforcement and deep reinforcement learning; Applications of machine learning for wireless communications: deep learning-based source and channel coding, narrowband and wideband channel estimation, signal detection, Multiple Input Multiple Output (MIMO) and Orthogonal Frequency Division Multiplexing (OFDM) detection, power allocation techniques; Model-based machine learning for communications: deep unfolding, reinforcement learning for physical layer communications, Q-learning, machine learning for spectrum access and sharing.	
9.	Textbook(s): 1. Eldar Y C, Goldsmith A, Gündüz D and Poor H V, Machine Learning and Wireless Communications, Cambridge University Press (2022).	
10.	Reference(s): 1. Mohri M, Rostamizadeh A and Talwalkar A, Foundations of Machine Learning, 2nd Edition, MIT Press, (2018). 2. He R and Ding Z, Applications of Machine Learning in Wireless Communications, IET (2019).	