1.	Title of the course	Introduction to Smart Grid Technology
2.	Course number	EE538L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5045/16
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To introduce state-of-the-art developments in smart power grids and the applications of new methodologies for operation, analysis, management, control, and monitoring of smart grids.	
10.	**Course Content:** Introduction to the smart grid: evolution of smart grid, need and benefits of smart grid, drivers for smart grid, functions, opportunities, and challenges; Enabling technologies: technology drivers, renewable energy resources, Phasor Measurement Units (PMU) and their applications; Distribution systems: DMS, Volt/Var control, fault detection, demand-side management, and transactive energy; Smart grid communications: local area network, house area network, wide area network, broadband over power line, IP based protocols, wireless sensor networks; Data analytics and AI techniques in smart grids: big data management, predictive analysis, applications of AI and ML techniques for smart grid cyber security.	
11.	**Textbook(s):** 1. Ali K and Muhammad M (Eds.), *Smart Power Grids*, 2nd Edition, Springer (2012). 2. Momoh J A, *Smart Grid: Fundamentals of Design and Analysis*, 1st Edition, Wiley (2012).	
12.	**Reference(s):** 1. Bakken D and Iniewski K, *Smart Grids: Clouds, Communications, Open Source, and Automation (Devices, Circuits, and Systems)*, 1st Edition, CRC PRESS (2014). 2. Hadjsaid N and Sabonnadiere J, *Smart Grids*, 1st Edition, WILEY (2012). 3. Stimmel C L, *Big Data Analytics Strategies for the Smart Grid*, 1st Edition, CRC PRESS (2015).	