1.	Title of the course	Modeling and Control of Autonomous Mobile Robots
2.	Course number	EE553L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To EE5059/19
6.	To be offered by	Department of Electrical Engineering
7.	To take effect from	January 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce the fundamental concepts and algorithms for the development of mobile robots to navigate autonomously in complex environments. To understand the kinematic and dynamic models for locomotion, environment perception, localization and mapping techniques, and motion planning.	
10.	**Course Content:** Review of state-space modeling for control, state estimation, and Kalman filter, types of mobile robots, locomotion concepts, mobile robot kinematics, perception using proximity and vision sensors, Simultaneous Localization and Mapping (SLAM) techniques, path planning, obstacle avoidance, navigation algorithms, kinematic control of mobile robots, vision-based feedback control, formation control, introduction to fog and cloud computing, fog and cloud robotics.	
11.	**Textbook(s):** 1. Roland S, Nourbakhsh I R and Scaramuzza D, *Introduction to Autonomous Mobile Robots*, 2nd Edition, MIT Press (2011). 2. Spyros T, *Introduction to Mobile Robot Control*, 1st Edition, Elsevier (2013).	
12.	**Reference(s):** 1. Amitava C, Anjan R and Singh N, *Vision Based Autonomous Robot Navigation: Algorithms and Implementations*, 1st Edition, Springer (2013). 2. Choset H M, Lynch K M, Hutchinson S, Kantor G, Wolfram B and Thrun S, *Principles of Robot Motion Theory, Algorithms, and Implementations*, 1st Edition, MIT Press (2005). 3. Lynch K M and Park F C, *Modern Robotics Mechanics, Planning, and Control*, 1st Edition, Cambridge University Press (2017).	