1.	Title of the course	Stochastic Dynamic Programming and Social Learning
2.	Course number	CS604L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CS6022/17
6.	To be offered by	Department of Computer Science and Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To study the dynamic programming based formalism of social learning models. To gain the intuition behind herding and cascading effects of social learning models and related optimization. To model the stopping-time characteristics of social learning.	
10.	**Course Content:** Review of probability and expectation; Review of MDPs and backward dynamic programming; Dynamic programming for POMDPs; Finite dimensional POMDP characterization, exact and suboptimal POMDP algorithms; Social learning: information cascades, herding, constrained social sensing, social learning in social network; Controlled sensing with social learning using POMDP; Stopping time POMDPs in multi-agent social learning: quickest detection and quickest time herding with social learning, optimal pricing under social learning customers.	
11.	**Textbook(s):** 1. Chamley C P, *Rational Herds: Economic Models of Social Learning*, 1st Edition, Cambridge (2003). 2. Krishnamurthy V, *Partially Observed Markov Decision Processes: From Filtering to Controlled Sensing*, 1st Edition, Cambridge (2016).	
12.	**Reference(s):** 1. Bertsekas D P, *Dynamic Programming and Optimal Control , Vol II*, 4th Edition, Athena Scientific (2012). 2. Bertsekas D P, *Dynamic Programming and Optimal Control, Vol I*, 4th Edition, Athena Scientific (2017). 3. Poor H V and Hadjiliadis O, *Quickest Detection*, 1st Edition, Cambridge (2008).	