1.	Title of the course	Data Science Programming Laboratory
2.	Course number	CS516P
3.	Structure of credits	0-0-3-2
4.	Offered to	PG
5.	New course/modification to	Modification To CS5195/12
6.	To be offered by	Department of Computer Science and Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To impart knowledge on programming languages, libraries and environments for building data science solutions. To provide hands-on experience on implementation of data life cycle processes.	
10.	**Course Content:** Introduction to data science software platforms, machine learning libraries and Integrated Development Environments (IDEs); Data pre-processing exercises including noise elimination, handling missing values, normalization, data wrangling, cleaning, handling structured and unstructured data including text, image, video, audio and numerical data, feature engineering, handling dimensionality and visualization; Model selection exercises including class balancing, hyper parameter search and learning curves; Model maintenance exercises including concept drift and incremental learning.	
11.	**Textbook(s):** 1. Geron A, *Hands-On Machine Learning with Scikit-Learn & TensorFlow: Concepts, Tools and Techniques to Build Intelligent Systems*, 1st Edition, Shorff/O' Reilly (2017).	
12.	**Reference(s):** 1. Lapan M, *Deep Reinforcement Learning Hands-on*, 1st Edition, Packt (2018). 2. Manaswi N K, *Deep Learning with Applications using Python*, 1st Edition, Apress (2018). 3. McKinney W, *Python for Data Analysis: Data Wrangling with Pandas, NumPy and IPython*, 1st Edition, O' Reilly (2017).	