

**Name of the Programme : M.Sc. in Data Science**

**Course Code : CSD-503**

**Title of the Course : Machine Learning (Practical)**

**Number of Credits : 2(0L-0T-2P)**

**Total Contact Hours : 60 hours (0L-0T-60P) Effective from**

**AY : 2023-24**

<b>Pre-requisites for the course</b>	Machine learning theory and programming in python	
<b>Course Objective:</b>	This course aimed at imparting implementation of machine learning algorithms using python and its APIs	
<b>Content:</b>	<b>Suggested Lab assignments/work with respect to the following using python (scikit /keras libraries) /amazon sage maker/matlab toolbox - each assignment with duration of 4 hrs. and 8 hrs. for project work</b>	
	1. Write a program to implement version space.	5 hours
	2. Write a program to implement a decision tree for given data.	5 hours
	3. Write a program to implement linear regression for given data.	5 hours
	4. Write a program to implement logistic regression.	5 hours
	5. Write a program to implement SVM.	5 hours
	6. Write a program to implement perceptron.	5 hours
	7. Write a program to implement a multilayer perceptron.	5 hours
	8. Write a program to implement RNN.	5 hours
	9. Write a program to implement CNN.	5 hours

	10. Write a program to implement HMM.	5 hours
	Capstone Mini Project work to assess the overall learning.	10 hours
<b>Pedagogy:</b>	Lab Assignments / Mini Project	
<b>References/ Readings</b>	<p>Main Reading:-</p> <ol style="list-style-type: none"> <li>1. Alpaydin, E. (2020). Introduction to machine learning. MIT press.</li> <li>2. Bishop, C. M. (2006). Pattern recognition and machine learning: springer New York.</li> <li>3. Flach, P. (2012). Machine learning: the art and science of algorithms that make sense of data. Cambridge university press.</li> <li>4. Goodfellow, I., Bengio, Y., &amp; Courville, A. (2016). Deep learning. MIT press.</li> <li>5. Hart, Peter E., David G. Stork, and Richard O. Duda.(2000) Pattern classification. Hoboken: Wiley, 2000.</li> <li>6. James, G., Witten, D., Hastie, T., &amp; Tibshirani, R. (2013). An introduction to statistical learning (Vol. 112, p. 18). New York: springer.</li> </ol>	
<b>Course Outcomes</b>	<ol style="list-style-type: none"> <li>1. Practical implementation skills of machine learning algorithms.</li> <li>2. Model development, evaluation, and feature engineering techniques.</li> <li>3. Interpretability and explainability of machine learning models.</li> <li>4. Awareness of ethical considerations in machine learning.</li> </ol>	

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