MACHINE LEARNING AND PYTHON PROGRAMMING

Semester	Subject	Category	Lecture		Theory Hrs		Practical		Credits
	Code		Hrs						
			Per	Per	Per	Per	Per	Per	
			week	Sem	week	Sem	week	Sem	
III		CORE	5	75	5	75	0	0	4
		PAPER-							
		9							

COURSE OBJECTIVE

- □ The course provides the understanding of basic neural network architecture.
- Understand data pre and post processing and Learn training, verification and validation of neural network models.
- □ This course also helps students to Understand Python programming concept.
- It helps students to implement python concepts in real world applications like Machine Learning

COURSE OUTCOME

On the successful completion of the course, students will be able to

CO	СО	Knowledge
Number	Statement	Level (K1-K4)
C01	Basic concepts of Machine Learning, learning methods	K1,K2
CO2	Understanding basic concepts of supervised learning	К3
CO3	Understanding basic concepts of supervised learning	K2 &K3

CO4	Understanding Basis of Python Programming.	K3
C05	Read and write data from/to files in Python programs	K2&k3

Knowledge Level – K1-Remember, K2- Understand, K3-Apply, K4-Analyze

MAPPING WITH PROGRAMME OUTCOME

cos	PO1	PO2	PO3	PO4	PO5	PO6	
CO1	S	S	S	М	S	S	
CO2	S	S	S	М	S	М	
CO3	S	S	М	М	S	М	
CO4	S	S	S	S	S	М	
CO5	S	S	S	M	S	М	
S-Strong		I	M-Mediu		L-Low		

S-Strong

L-Low

16 hrs

SYLLABUS

UNIT I: I Machine Learning Introduction

Machine Learning – Types of machine learning- Machine Learning Applications – Key elements of machine learning - Perspectives and Issues, Version Spaces, Finite and Infinite Hypothesis Spaces - PAC Learning -Learning a Class from Examples - Vapnik-Chervonenkis Dimension -Linear, Non-linear, Multi-class and Multi-label classification- Statistical learning: Bayesian Method, The Navie Biayes classifier

UNIT II: Supervised Learning

Decision Trees: ID3, Classification and Regression Trees, Regression: Linear Regression, prediction using linear regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variable. Logistic Regression- classification using logical regression, logical regression with one variable and with multiple variable, linear vs logistic Networks: Introduction, Perceptron, regression. Neural Multilaver

16 hrs

Perceptron, Support vector machines: Linear and Non-Linear, Kernel Functions, K-Nearest Neighbours

UNIT III: Unsupervised Learning 13

Unsupervised Learnin: Introduction to clustering, Hierarchical: AGNES, DIANA, Partitional: K-means clustering, K-Mode Clustering, Expectation Maximization, Gaussian Mixture Models Principal components analysis (PCA), Locally Linear Embedding (LLE), Factor Analysis.

UNIT IV: Python Fundamentals

Introduction - Python Character set - Tokens- Input and output functions

- Data types- Variables- Expressions- Statements - Operators- Comments

- Control Flow statements - Functions - Lists - Tuples - Dictionaries

UNIT IV: Files, Modules, Packages

Files and exception - Text files - Reading and Writing files - Command line arguments, Errors and Exceptions, Handling exceptions, Modules, Packages - Data Visualization using python.

Distribution of Marks: Theory 80% and Problems 20% TEXT BOOKS

S.No	Authors	Title	Publishers	Year of
				publication
	Ethem Alpaydin,	Introduction to	MIT Press, Prentice Hall of	2014
		Machine	India, Third Edition	
1	Allen B. Downey	Think Python: How to Program	Shroff/O'Reilly Publishers, 2 nd edition, Updated for Python 3	2016

REFERENCE BOOKS

15 hrs

15 hrs

13 hrs

S. No	Authors	Title	Publishers	Year of
				publication
1.	Kevin P. Murphy	Machine Learning: A Probabilistic Perspective	The MIT Press,	2012
2.	Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar	Foundations of Machine Learning	MIT Press	2012
3.	Tom Mitchell	Machine Learning	McGraw Hill, 3rd Edition	1997
4.	Paul Barry	Head-First Python	O'Reilly Publishers	2016
5.	Zed A. Shaw	Learn Python3 The Hard way	Addison-Wesley	2016
6.	Guido van Rossum and Fred L. Drake Jr.	An Introduction to Python- Revised and updated for Python 3.2	Network Theory Ltd	2011
7.	avid Ascher and MARK LUTZ	Learning Python	O'Reilly Media	1999
8.	Wes McKinney	Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython	O'Reilly Media	2011

WEB SOURCES

- 1. http://dai.fmph.uniba.sk/courses/ICI/marsland.ml-alg-perspect.09.pdf
- 2. <u>https://faculty.ucmerced.edu/mcarreira-</u> perpinan/teaching/CSE176/lecturenotes.pdf
- 3. <u>http://profsite.um.ac.ir/~monsefi/machine-learning/pdf/Machine-</u> Learning-Tom-Mitchell.pdf
- 4. <u>http://greenteapress.com/wp/think-python/</u>
- 5. <u>http:/</u>/www.guru99.com/python-tutorials.html

TEACHING METHODOLOGY

- ➤ Power point presentation
- ➤ seminar by students
- ➤ Assignment to students

- ≻ Lecture through video.
- ► Discussion and interaction in class room

SYLLABUS DESIGNER

- 1. Mrs. G.Sangeetha Lakshmi , Assistant Professor and Head, Department of Computer Science
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