SANKALCHAND PATEL UNIVERSITY ।। अथातो ज्ञानजिज्ञासा ।।	**FACULTY OF COMPUTER SCIENCE** **Master of Computer Application (Integrated) (Sem-VI)** In Effect from Academic Year 2023-24

Branch Name:	IMCA
Program Code:	CS301
Course Title	Machine Learning
Course Code	1CS3010602T
Pre-requisite Course:	Basics of computer science including algorithms, data structure, probability theory

Course Objective:

1. To learn various machine learning algorithms & their area of applications.
2. To learn the process of formulating & solving real world problems using machine learning.
3. To learn the implementation of various decision-making problems using machine learning.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory		Practical		
Lecture	Tutorial	Practical	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Total
4	-	-	4	60	40	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage (%)
1	**Introduction to Machine Learning:** Introduction to Machine Learning: Overview of Human Learning and Machine Learning, Types of Machine Learning, Applications of Machine Learning , Tools and Technology for Machine Learning.	5	10
2	**Preparing to Model** Preparing to Model: Machine Learning activities, Types of data in Machine Learning, Structures of data, Data quality and remediation, Data Pre-Processing, Dimensionality reduction, Feature subset selection. **Feature Engineering** Basics of Feature Engineering: Feature and Feature Engineering, Feature transformation: Construction and extraction, Feature subset selection : Issues in high-dimensional data, key drivers, measure and overall process	10	20
3	**Modeling and Evaluation** Selecting a Model: Predictive/Descriptive, Training a Model for supervised learning, model representation and interpretability, evaluating performance of a model, Improving performance of a model.	10	20
4	**Supervised Learning: Classification and Regression:** Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification Algorithms Example of Regression, Common regression Algorithms	11	25

5	**Unsupervised Learning:** Unsupervised Learning versus Supervised Learning, Applications of Unsupervised Learning, Clustering, Finding Pattern using Association Rules **Neural network** Introduction to neural network, Biological and Artificial Neurons, Types of Activation functions, Implementation of ANN	12	25

Text Books:

1. Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das , "Machine Learning", Pearson Education

References Books:

1. Tom M Mitchell, "Machine Learning", McGraw Hill,
2. Anuradha Srinivarasaraghavan, Vincy Joseph, "Machine Learning", Wiley India
3. Peter Harrington, Machine Learning in Action, DreamTech

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understanding Various Machine Learning Algorithms & Their Area of Applications	1 Remembering 2 Understanding
CLO2	Explain the Process of Formulating & Solving Real World Problem using Machine Technology	1 Remembering 2 Understanding 3 Applying
CLO3	Design and Implement various Decision-Making Problems using Machine Learning	3 Applying 4 Analyze 5 Evaluate 6 Create

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Out comes(POs)												Program Specific Outcomes(PSOs)	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2
CLO1	H	M	H	M	L	M	M	L		L	H	H	H	H
CLO2	M	H	H	H	H	M	M	L		L	M	L	H	H
CLO3	M	M	M	M	M	M		L		M	M	L	H	H

H:High, M:Medium, L:Low