



GUJARAT TECHNOLOGICAL UNIVERSITY

Syllabus for Integrated MSc, 8th Semester

Branch: Information Technology

Subject Name: Machine Learning

Subject Code: 1380501

Teaching and Examination Scheme

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
				ESE(E)	PA (M)	PA (I)	ESE(V)	
3	0	2	4	70	30	20	30	150

Content:

Sr. No.	Content	Teaching Hours	Module Weightage (%)
1.	Introduction to Machine Learning: What is human learning? What is Machine Learning? Human learning versus machine learning, Types of machine learning, Applications of machine learning, Tools for machine learning	04	10
2.	Preparing to Model , Feature Engineering: Machine Learning activities, Basic Types of data in Machine Learning, Structures of data, Data Quality and Remediation, Data Pre-Processing, Introduction to Feature Engineering, Feature Transformation, Feature Subset Selection	05	15
3.	Modelling and Evaluation: Selecting a Model, Training a Model, Model Representation and Interpretability, Evaluating Performance of a Model, Improving Performance of a Model	05	15
4.	Supervised Learning: Classification and Regression: Supervised Learning, Classification Model, Learning steps, Classification algorithms, Regression, Regression algorithms	10	20
5.	Unsupervised Learning: Supervised vs. Unsupervised Learning, Applications, Clustering, Association rules	06	20
6	Neural Network: Introduction to neural network, Biological and Artificial Neurons, Types of Activation functions, Implementation of ANN, Architecture, Learning process, Backpropagation, Deep Learning	10	20

Reference Books:

- 1) Peter Harrington, “Machine Learning in Action”, DreamTech
- 2) Michael Bowles, “Machine Learning in Python”, Wiley
- 3) Gavin Hackeling, Mastering Machine Learning with scikit-learn, Packt
- 4) Giuseppe Bonaccorso, Machine Learning Algorithms - Second Edition, Packt



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Course Outcome:

After learning the course, the students should be able to:

No.	CO statement
CO-1	Explore the fundamental issues and challenges in Machine Learning including data and model selection and complexity.
CO-2	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms
CO-3	Evaluate the various Supervised Learning algorithms using appropriate Dataset.
CO-4	Evaluate the various Unsupervised Learning algorithms using appropriate Dataset.
CO-5	Explain the Process of Formulating & Solving Real World Problem using Machine Technology.