

GANPAT UNIVERSITY									
FACULTY OF DIPLOMA ENGINEERING									
Programme		Diploma Engineering				Branch/Spec.		Electronics and Communication Engineering	
Semester		V				Version		1.0.0.0	
Effective from Academic Year			2026-27			Effective for the Batch admitted in			July 2024
Course Code		1EC61PE03		Course Name		Machine Learning			
Teaching Scheme						Examination Scheme (Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites									
Basic knowledge of Mathematics, Python programming, statistics, data handling and logical thinking									
Course Outcomes									
On successful completion of the course, the students will be able to:									
CO1	Understand and discuss the need for machine learning in solving real-world problems.								
CO2	Use Python libraries such as NumPy, Pandas, Matplotlib, and Scikit-learn to implement machine learning solutions.								
CO3	Design and develop machine learning models and apply appropriate evaluation methods to assess their performance.								
CO4	Apply suitable supervised and unsupervised learning algorithms based on dataset characteristics.								
Theory Syllabus									
Unit	Content								Hrs.
1	Introduction to Machine Learning Overview of Human Learning and Machine Learning, Types of Machine Learning: Supervised, Unsupervised, Reinforcement, Benefits Machine Learning, Challenges of Machine Learning Applications of Machine Learning								5
2	Libraries for Machine Learning Numpy, Creating and Accessing Array: array(), zeros(), ones(), arange(), reshape() ,Stacking & Splitting: stack(), split() ,Maths Functions: add(), subtract(), multiply(), divide(), power(), sqrt(), Statistics Functions: mean(), median(), std(), var() ,Pandas: Data structure: Series(), DataFrame() Manipulating Data: isnull(), sum(), min(), max() drop(), dropna(), duplicated() , loc[], head(), tail(), shape, columns, sort_values() Matplotlib, Functions: plot(), scatter(), bar(), hist(), boxplot() , pie(), title(), xlabel(), ylabel(), grid(), show(), savefig(), Scikit-learn Key concepts and features Functions: load_*(), train_test_split()								10
3	Preparing to Model and Evaluation Machine Learning activities, Types of data in Machine Learning: Numerical (quantitative) data, Categorical (qualitative) data, Data quality and remediation Data Pre-Processing: Dimensionality reduction, Feature subset selection, selecting a Model: Predictive/Descriptive Training a Model for supervised learning: Holdout method, K-fold Cross-validation method Performance Evaluation of a model: confusion matrix, Improving Performance of a model								10
4	Supervised Machine Learning Introduction to Supervised Learning, Brief explanation of Supervised Machine Learning, Learning Steps in Supervised Machine Learning, Real world Applications/Examples of Supervised Machine Learning, Advantage and disadvantage of Supervised Machine Learning Classification, Define Classification, Regression, Define Regression analysis, List types of Regression								10

5	Unsupervised Machine Learning and Generative AI Introduction of Unsupervised Learning, Need of unsupervised learning, Working of unsupervised learning , Types of unsupervised learning: Clustering, Association rules, Real-world examples of unsupervised Learning, Supervised vs. Unsupervised Learning Generative AI, Define Generative AI, Working of Generative AI, Applications of Generative AI	10
Practical Content		
Practical assignments and tutorials are based on the above syllabus.		
Text Books		
1	Machine Learning, Mitchell T, McGraw-Hill, 1997	
Reference Books		
1	Machine Learning, Saikat Dull, S. Chjandramouli, Das, Pearson	
2	Machine Learning_ Step-by-Step Guide To Implement Machine Learning Algorithms with Python	
ICT/MOOCs Reference		
1	https://nptel.ac.in/courses/106106139	
2	https://nptel.ac.in/courses/106106179	

Mapping of CO with PO and PSO:															
	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3
CO1	2	2	1	-	1	-	-	-	-	1	-	1	2	1	1
CO2	3	2	3	2	3	-	-	-	-	1	1	-	3	2	2
CO3	3	3	3	3	2	-	-	-	-	1	1	-	3	3	2
CO4	3	3	3	2	2	-	-	-	-	1	1	-	3	3	3