Program : **Diploma in Computer Engineering / Computer Hardware Engineering / Information Technology**	
Course Code : **5133C**	Course Title: **Fundamentals of Artificial Intelligence and Machine Learning**
Semester : **5**	Credits: **4**
Course Category: **Program Elective**	
Periods per week: **4 (L:4 T:0 P:0)**	Periods per semester: **60**

Course Objectives:

- To impart fundamental understanding of artificial intelligence and machine learning concepts.
- To build real world artificial intelligence applications using python.
- To lay the foundation for the advanced courses like deep learning, neural networks, genetic algorithms.

Course Prerequisites:

Topic	Course code	Course name	Semester
Basic Mathematics		Mathematics	1,2
Problem solving and Programing concepts		Problem solving and Programing	2
Object Oriented Programming concepts		Object Oriented Programming	4

Course Outcomes :

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Develop fundamental understanding of AI	10	Understanding
CO2	Demonstrate python program to solve the problems in AI	20	Applying
CO3	Use python in Machine Learning	18	Applying
CO4	Apply AI using Python in Gaming	10	Applying
	Series Test	2	

CO – PO Mapping

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	3						
CO2	3						
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Develop a fundamental understanding of AI**		
M1.01	Describe Artificial Intelligence and the necessity of Learning AI	3	Understanding
M1.02	Summarize the different types of Learning	3	Understanding
M1.03	Describe the different fields of AI	2	Understanding
M1.04	List the applications of AI	2	Understanding
Contents: Introduction to Artificial Intelligence - Necessity of Learning AI - Different types of Learning-Different fields of AI - Application of AI - AI tools and learning Models			
CO2	**Demonstrate python program to solve the problems in AI**		
M2.01	Recall the Role of Python in AI, Features of python, Installing Python	2	Understanding

M2.02	Recall Python Basics Data Types, Conditional Statements, Looping, Control Statements, String	6	Understanding
M2.03	Implement List And Dictionary Manipulations, Python Functions, Modules and Packages	6	Applying
M2.04	Implement Object Oriented Programming in Python, Regular Expressions	6	Applying
	Series Test – I	1	
Contents: Role of python in AI-Features of python-Installing python-Python:- Basics Data Types, Conditional Statements, Looping, Control Statements, String, List And Dictionary Manipulations, Python Functions, Modules And Packages, Object Oriented Programming in Python, Regular Expressions, Exception Handling			
CO3	**Use python in Machine Learning**		
M3.01	Explain Machine learning	2	Understanding
M3.02	Discuss the types of machine learning-Supervised machine learning algorithms-Classification and Regression, Unsupervised machine learning algorithms-Clustering and Association	4	Understanding
M3.03	Identify the most commonly used Machine learning Algorithms-, Linear Regression, KNN, K Means, Regression, Support Vector Machines (SVM)	6	Understanding
M3.04	Use Data Preparation - Preprocessing the Data using numpy Techniques for Data Preprocessing - Binarization - Mean Removal, Scaling, Normalization	4	Applying
M3.05	Demonstrate the Steps for Building a Classifier in Python	2	Applying
Contents: MachineLearning - Types of Machine learning-Supervised and Unsupervised Learning - Classification and Regression, Linear Regression, KNN, K Means, Regression, Support Vector Machines (SVM), Data Preparation - Preprocessing the Data using numpy, Techniques for Data Preprocessing- Binarization-Mean Removal, Scaling, Normalization, Classification and Regression, Steps for Building a Classifier in Python, Building classifier in python - Naïve Bayes,Support Vector Machines (SVM),Decision Tree classifier, Random Forest.			
CO4	**Apply AI with Python in Gaming**		
M4.01	Describe Search Algorithms	2	Understanding
M4.02	Discuss the different types of search	3	Understanding

	algorithms- Combinational Search, Minimax Algorithm		
M4.03	Illustrate Building Bots to Play Games	1	Applying
M4.04	Demonstrate a Bot to Play Last Coin Standing	2	Applying
M4.05	Demonstrate a Bot to Play Tic Tac Toe	2	Applying
	Series Test – II	1	

Contents:

Search Algorithms- Combinational Search, Minimax Algorithm. Building bots to play games, Bot to play last coin standing game, Bot to play tic tac toe

Text / Reference

T/R	Book Title/Author
T1	Artificial Intelligence with Python: Your complete guide to building intelligent apps using Python 3.x and TensorFlow 2, 2nd Edition , by Alberto Artasanchez , Prateek Joshi
R1	Core python programming by Nageswara Rao
R2	Let us python by Yashvant kanetkar

Online Resources

Sl.No	Website Link
1	http://www.tutorialspoint.com/python
2	https://www.tutorialspoint.com/weka
3	https://www.tutorialspoint.com/artificial_intelligence_with_python/artificial_intelligence_with_python_tutorial.pdf