



**Semester – V**

**Subject Name: Machine Learning using Python**

**Subject Code: 09CT0513**

**Diploma Branches in which this subject is offered:** Information and Communication Technology

**Objective:** After successful completion of this course, students can able to do Python programming with knowledge of various libraries and operations in python scripting. Using Python and related simulation tools students able to implement machine learning algorithms to specifies datasets as well as model evaluation.

**Credits Earned:** 04 Credits

**Course Outcomes:**

- To understand the various Data types , decision making statement and loops in Python scripting
- Apply various Machine learning algorithms to specified datasets.
- Remember Statistical testing approach towards Machine learning and model evaluation.
- Understand List, tuple, function, string and various python libraries in Python programming.

**Pre-requisite of course:** Basic Programming

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
3	0	2	4	50	30	20	25	25	150

**Contents:**

Unit	Topics	Contact hours
1	Introduction to Python Installing Python; basic syntax, interactive shell, editing, saving, and running a script.	2
2	Data types in python variables, assignments; immutable variables; numerical types; arithmetic, Logical operators and expressions; comments in the	2



	program; understanding error messages	
<b>3</b>	Conditional and Decision Making Statements Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); break, continue statements	<b>4</b>
<b>4</b>	String manipulations subscript operator, indexing, slicing a string; strings and number system: converting strings to numbers and vice versa. Binary, octal, hexadecimal numbers	<b>3</b>
<b>5</b>	Lists, tuples, and dictionaries Basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries.	<b>6</b>
<b>6</b>	Functions, Scoping and Abstraction Functions and scoping, Specifications, Recursion, Global variables, Modules, Files, System Functions and Parameters	<b>6</b>
<b>7</b>	Basics of Python Libraries Numpy, Pandas, Seaborn, Matplotlib, Scikit-Learn libraries of python	<b>6</b>
<b>8</b>	Cleaning and Processing the Data Understanding Data, Importing Dataset, Identify and Handle Missing Values, Data Formatting, Data Normalization, Sets	<b>3</b>
<b>9</b>	Machine Learning using Python Introduction to Machine Learning, Regression, Linear Regression, Logistic Regression, Multi Variable Regression, Classification, K-Nearest Neighbor	<b>7</b>
<b>10</b>	Model Evaluation Descriptive Statistics, Grouping, ANOVA, Correlation, R-Squared and MSE for evaluation	<b>4</b>
<b>TOTAL HOURS</b>		<b>43</b>

**Reference books:**

1. Learning Python by Mark Lutz , 6<sup>th</sup> edition - O'REILLY PUBLICATION  
DOI : [https://cfm.ehu.es/ricardo/docs/python/Learning\\_Python.pdf](https://cfm.ehu.es/ricardo/docs/python/Learning_Python.pdf)
2. Head-First Python, 2nd edition Paul Barry (O'Reilly, 2016)
3. Python Machine Learning by Sebastian Raschka
4. Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems by Aurelien Geron.

**MOOC Courses:**

1. Machine Learning by Andrew NG – Coursera
2. Python for everybody by Charles Severance
3. Data Science: Statistics and Machine Learning Specialization- Coursera
4. Machine Learning A-Z™: Hands-On Python & R In Data Science- Udemy