

Syllabus
Artificial Intelligence Associate

S No.	NOS/Module Name	Topics	Duration (Hours)		Learning Outcomes
			Theory	Lab	
1	Programming with Python	<ul style="list-style-type: none"> Installing and configuring Python IDE Understanding Python syntax, data types, operators, control flow Working with built-in data structures – lists, tuples, dictionaries, sets Functions, modular programming and package management Small project using multiple modules and packages 	20	40	<ul style="list-style-type: none"> Students will be able to learn to install and configure the python IDE and learn about working on collaborative cloud interface required for programming Students will understand the basics of Python Language and will be able to recognize Python syntax Students will understand and write programs in python language, compile, debug and handle exceptions Student will have an understanding of working with top down or bottom up approach by making functions. Students will come to know about benefits of modular programming by defining and calling various functions. Students will be able to explain various ways of passing the parameters to functions and difference between all the ways. Students will learn the working of different data structures which allow to organize and store data.

2	Conceptualizing Data Science with python	<ul style="list-style-type: none"> • Introduction to Data Science concepts and tools • Preprocessing and cleaning raw data • Using NumPy for numerical operations and array handling • Statistical analysis using Python 	23	37	<ul style="list-style-type: none"> • Students will learn about the concept of Data Science that relies on mathematical and statistical formulas to extract data and make sense of it. • Students will learn about unstructured and raw data and how to convert that into meaningful form. • Students will learn about how data can be converted into assets to help improve revenue by improving customer experience, and more. • Students will learn about various tools used for processing volumes of data. • Students will learn about techniques to pre-process the data to make it ready for analysis. • Students will learn about the library which deals with n-dimensional arrays. • Students will work on the library to perform a wide variety of mathematical operations on arrays.
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3	Data analysis and Visualization	<ul style="list-style-type: none"> Using Pandas for structured data analysis Data Frames and Series in Pandas Exploratory Data Analysis (EDA) techniques Creating data visualizations using Matplotlib and Seaborn 	30	60	<ul style="list-style-type: none"> Student will be able to distinguish the differences between Numpy and Pandas. Students will be able to analyze Big Data and make conclusions based on statistical theories. Students will learn to represent data in way that will facilitate better results for data science projects. Students will learn to use Pandas for cleaning messy datasets, and make them readable and relevant through huge set of commands and features. Students will learn to filter, segment, merge and segregate the datasets. Students will be able to demonstrate the role of Pre-processing, Analysis and Data science through guided case study and exercise Student will learn how business problems can be understood by using Visualization techniques.
4	Fundamentals of Machine Learning	<ul style="list-style-type: none"> Introduction to ML and learning types (supervised, unsupervised, reinforcement) Setting up ML environment with Scikit-learn Building and evaluating ML models 	12	18	<ul style="list-style-type: none"> Students will learn the concept of Machine Learning and its various categories and its application. Students will be able to understand the difference between Supervised, unsupervised, and reinforcement learning Students will be able to understand different paths of Machine Learning, i.e., Computer Vision, Predictive Analysis, Natural Language Processing and other applications. Student will be able to implement ML models using various Classification and Regression algorithms. Students will be able to understand the complete cycle of AI Project. Student will be applying models using various algorithms in Scikit-learn library.

5	Performance and Accuracy of Machine Learning models.	<ul style="list-style-type: none">• Predictive analysis with regression and classification• Statistical techniques for model building• Feature selection and evaluation metrics• End-to-end ML project implementation	35	55	<ul style="list-style-type: none">• Students will be able to make predictions about future events by applying various Regression algorithms and Classification algorithms.• Students will learn to apply ML models to analyze historical data with the goal of identifying trends or patterns and then using those insights to predict future outcomes.• Students will apply various statistics techniques like Correlation, hypothesis, Normal Distribution etc. to build a good predictive model.• Students will learn to measure predictive validity by applying various metrics of classification and regression.• Students will enhance predictive models by using Feature Selection, highlighting patterns and bringing domain expertise.• Students will learn how good metrics measure progress and bring improvement with respect to the business problem.
Sub Total = 330 hours			120	210	
6	Employability Skills		60		Students will be able to get the additional skills apart from the technical skills, to be job ready
7	OJT/Project		60		Students will be able to learn the working in a job.
Total Duration			450		

List of Tools and Equipment

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Classroom	1 (30 Sq.m)	30
2	Student Chair	30	30
3	Student Table	30	30
4	Desktop computers with accessories	32 GB RAM with Camera, Headphone and Installed with: Linux/Windows, Wifi / Internet connectivity Installed with software: NumPy, Pandas, Matplotlib, Seaborn, Scikit-Learn	30
5	Desk jet printer	1 Nos.	A4